DAIHATSU

TERIOS

J100

TO INDEX

BODY ELECTRICAL SYSTEM

JBE00001-00001

BE

NO. 9710-JE

GENERAL DESCRIPTION

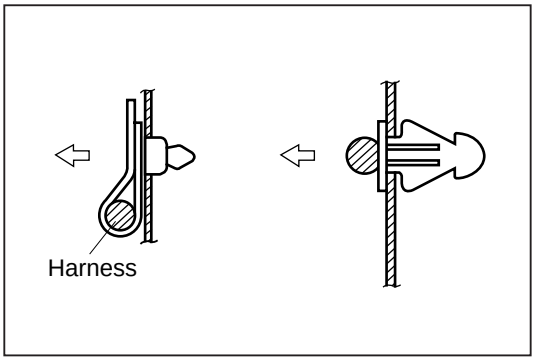
HANDLING PRECAUTION

General instructions

1. Never pull the connectors or step on them during the wire harness transport or assembly.
   (Prevention of pulling-out of terminals, connector cracks, deformation and so forth.)

JBE00002-00002

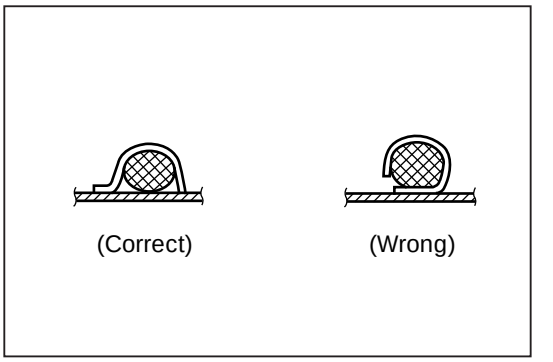
2. Care must be exercised to ensure that no scratch is made to the wire harness by burrs or edges during the wire harness transport or assembly.
   (Prevention of scratches to the outer trim, electrical insulators and so forth.)
3. Clamping method
   In the case of resin clamps, ensure that the clamp section is fitted in the body hole.



JBE00003-00003

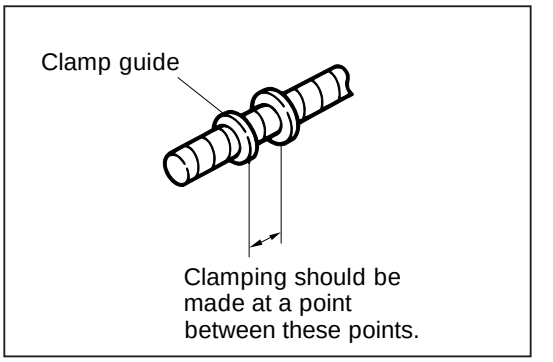
NOTE:

- Ensure that the clamp will not be detached when it is pulled lightly in the arrow-headed direction.
  (Prevention of interference due to the detachment of the clamp)
- In the case of metal sheet welded clamps, be sure to assemble the harness in such a way that the harness will not come in contact with the welded surface.
  (Prevention of wire harness damage due to welding burrs)



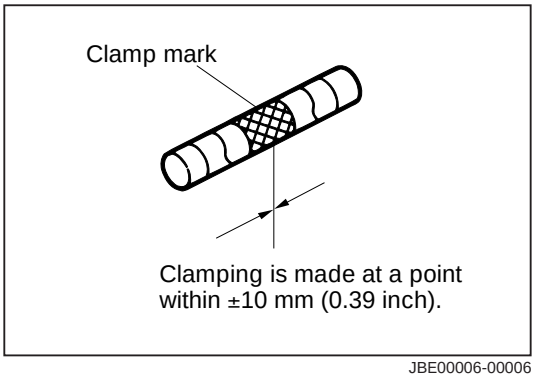
JBE00004-00004

- In case that the locating guide of the clamp position or the clamp mark is clamped, make sure that the clamp is located within the guide. As for the clamp at the clamp mark section, ensure that the clamping is made at a point within ±10 mm.



JBE00005-00005

(Prevention of slackness or interference)



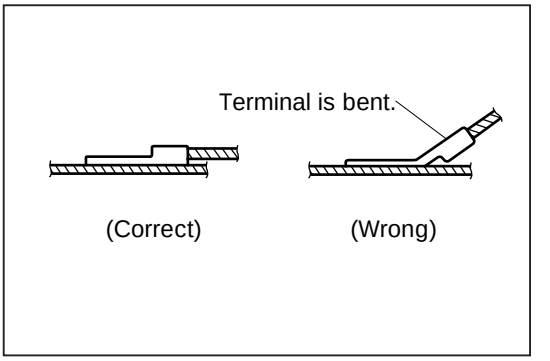
JBE00006-00006

4. Terminals and connectors
   Perform the connection of connectors positively.
   Connector with lock; Ensure that the locking is made.
   Connector without lock; Connect the connector positively until it stops.

JBE00007-00007

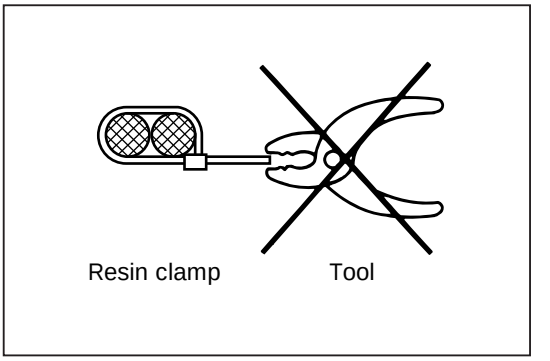
Retention by screws

- When the tightening torque is specified, be sure to observe the specification strictly.
  (The tightening torque is posted in the table separately.)
- Ensure that the staked section may not come on the assembling surface.
- After completion of the tightening operation, lightly pull out the terminal. Ensure that there is no slackness.
- When performing other operations, care must be exercised to ensure that no connected connector is detached by pulling out the wire harness forcibly.



JBE00008-00008

5. Work procedure for tightening-up type resin clamps
   When the tightening-up type resin clamps are employed, do not use any pliers, cutting pliers or the like.
   <Reason>
   Prevention of clamps being cut or scratched



JBE00009-00009

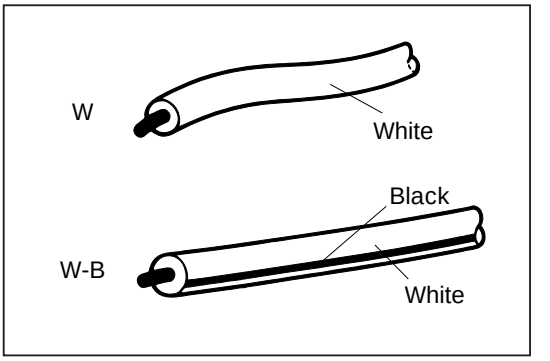
WIRE SIZE & COLOR CODE

- For identification purpose, each wire has its own color. Each color bears a code as described in the right table. These codes are used in the wiring diagram and will be helpful during trouble shooting.

Code	Gr	Br	B
Color	Gray	Brown	Black
Code	W	R	G
Color	White	Red	Green
Code	Y	L	O
Color	Yellow	Blue	Orange
Code	P	Lg	V
Color	Pink	Light green	Violet

JBE00010-00010

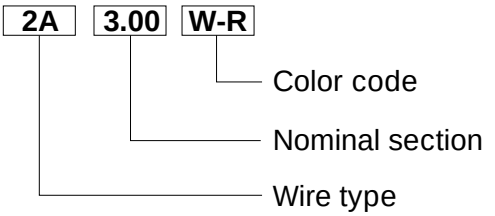
- The wire color comes in two kinds: single color and composite color. In the case of single color, the whole outer coat of the harness is of a single color.
  In the case of composite color, a fine line of the second color is drawn on the harness basic color.
  In this case, the code is composed of the basic color code which comes first and the second color code which comes after a hyphen.



JBE00011-00011

WARNING:
- The wire diameter and capacity of each harness have been determined to assure the normal operation of the electrical system.
- Hence, do not take power for accessories carelessly through the original wiring harness. Failure to observe this caution may cause system malfunction or fire.

JBE00012-00012



JBE00013-00013

Nominal section	Section area (mm)	Diameter (mm)	Permissible current (A)
0.5	0.56	1.0	9
0.85	0.88	1.2	12
1.25	1.28	1.5	15
2.00	2.09	1.9	20
3.00	3.29	2.4	27

JBE00014-00014

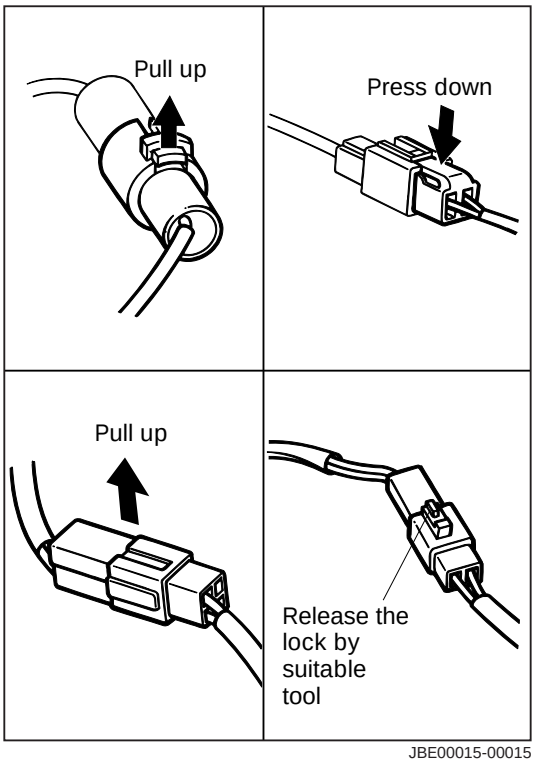
OPERATION OF LOCK TYPE CONNECTOR

Conventional type

The lock type of the connector comes in a push release type, a pull release type, a spring lock type, an one-way lock type and so on.

After confirming the shape of the lock, unlock the lock. Disconnect the connector white holding the connector by hand.

NOTE:
- Never pull the harness during the disconnection.
- Be sure to pull out the connector straight so as not to damage the terminal.



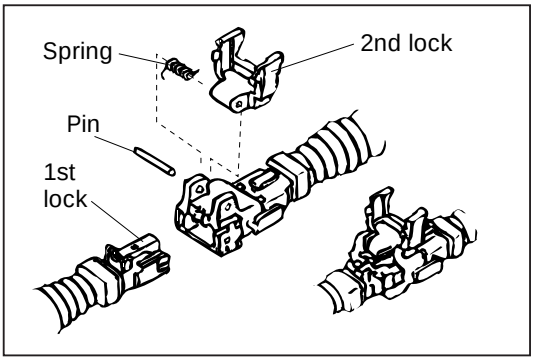
JBE00015-00015

Double lock type

The double lock type connector has been adopted for air bag system to prevent unexpected troubles such as poor connecting.

NOTE:

- Disconnection and connection of each connector should be kept at a minimum level. If unnecessary disconnection or connection is repeated, it may cause unexpected troubles such as poor continuity and chattering.



JBE00016-00017

TERMINAL REMOVAL & INSTALLATION

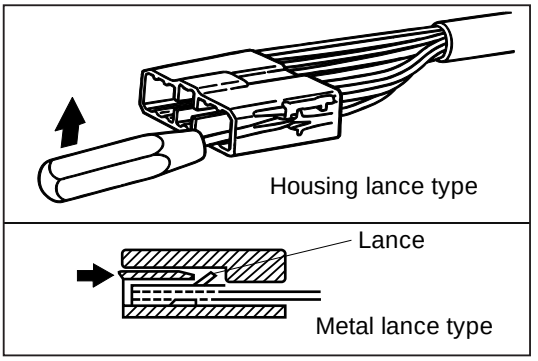
Removal of terminal

<Housing lance type>

Insert a miniature screwdriver through the opening section of the connector into between the locking lug and the terminal. While prying up the locking lug with the screwdriver, pull the terminal backward.

<Metal lance type>

While pushing the lance with the screwdriver, pull the terminal backward.



JBE00017-00018

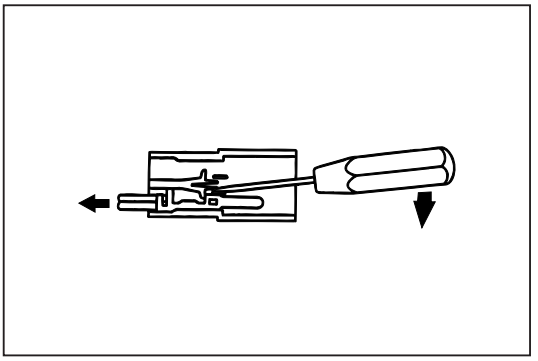
Installation of terminal

<Housing lock type>

Push the terminal into the protruding section of the connector, until the lock is engaged completely. Lightly pull the harness to assure that the locking has been made completely.

<Metal lance type>

Insert the terminal into the connector, until lance is locked completely. Lightly pull the harness to assure that the locking has been made completely.



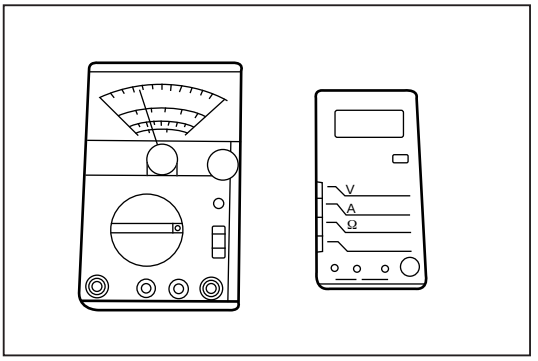
JBE00018-00019

INSPECTION

Tester (Volt/ohmmeter)

For the inspection, use a tester having an internal resistance of more than 10 kΩ/V.

Use of a tester with a low internal resistance may cause wrong measurement or secondary troubles.

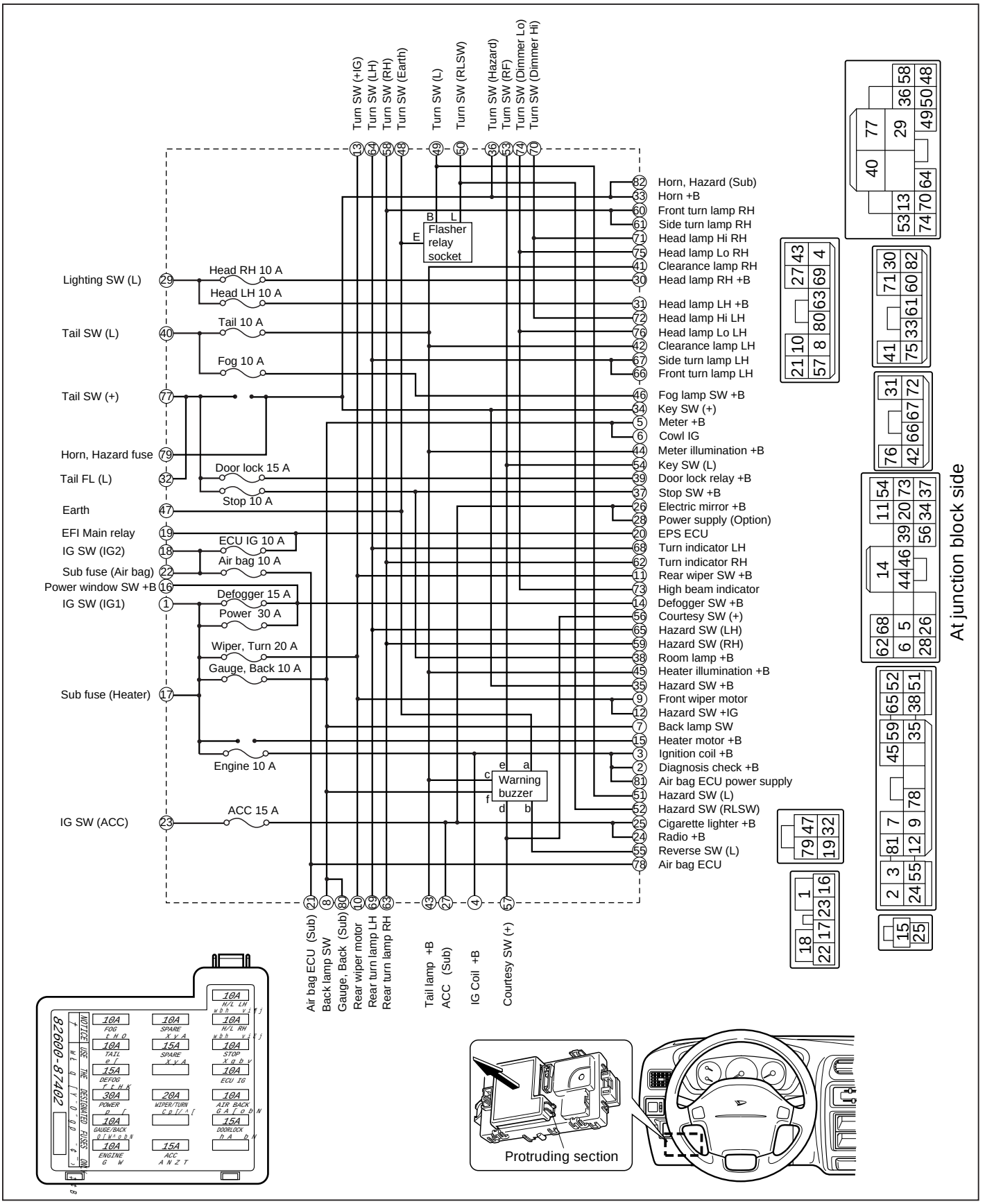


JBE00019-00020

POWER SUPPLY

JUNCTION BLOCK

The junction block assembly is located underneath the steering post at the driver's seat side.

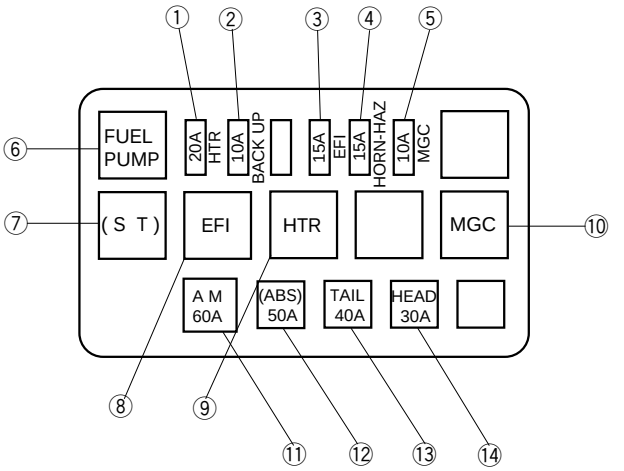


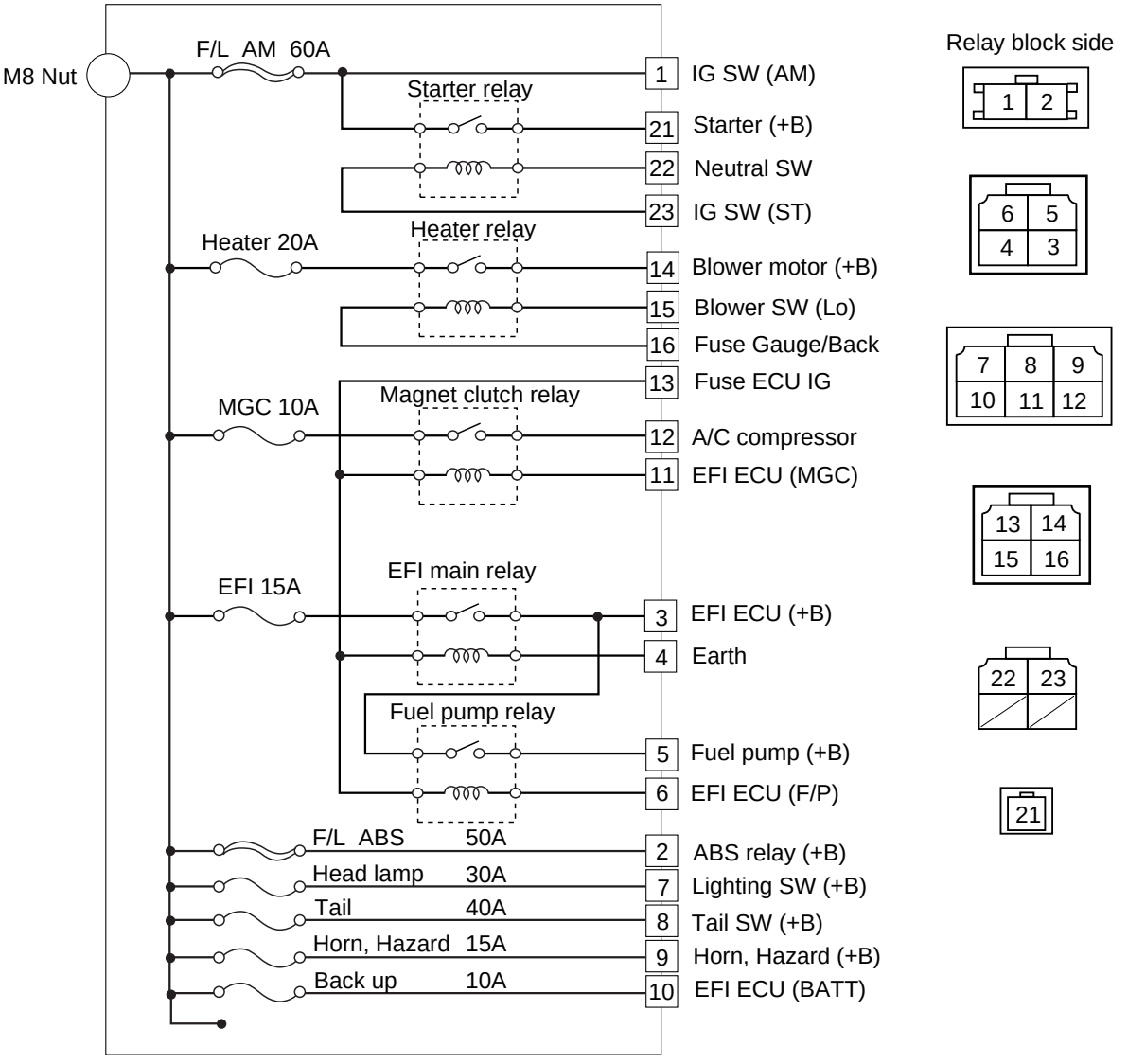
JBE00020-00101

RELAY BLOCK

The relay block is located near the battery in the engine compartment.

① Heater 20A
② Back-up 10A
③ EFI 15A
④ Horn-Hazard 15A
⑤ Magnet clutch 10A
⑥ Fuel pump relay
⑦ Starter relay (for A/T)
⑧ EFI main relay
⑨ Heater relay
⑩ Magnet clutch relay (for air conditioner)
⑪ F/L AM 60A
⑫ F/L ABS 50A
⑬ Tail lamp 40A
⑭ Head lamp 30A

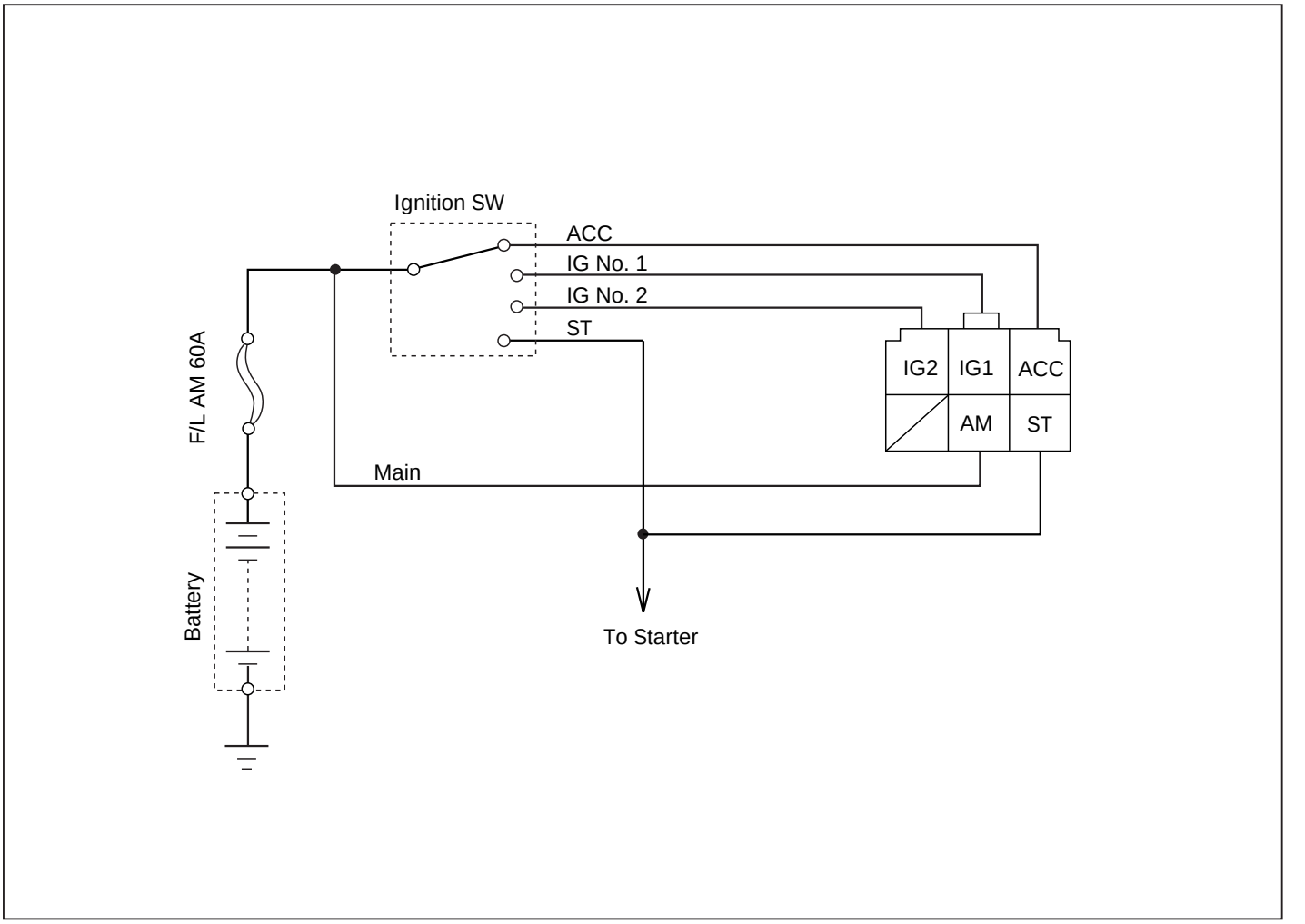




Relay block side

IGNITION KEY SWITCH

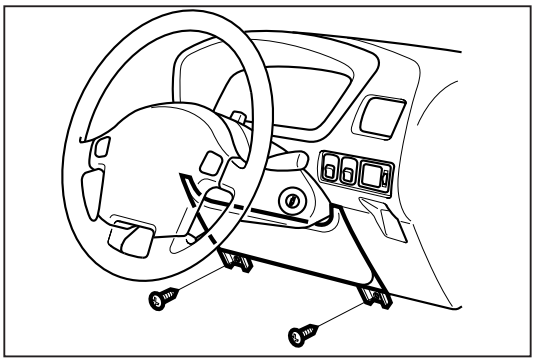
WIRING DIAGRAM



JBE00022-00201

Removal

1. Turn off the ignition key switch.
2. Disconnect the battery ground cable from the negative (–) terminal of the battery.
3. Remove the instrument lower panel and steering column lower cover.
4. Disconnect the connectors of the ignition switch.
5. Disconnect the immobilizer antenna terminal, if equipped.

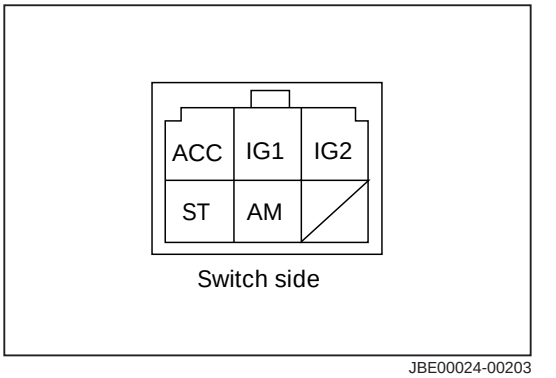


JBE00023-00202

UNIT INSPECTION

Ensure that continuity exists between the respective terminals as indicated in the continuity table.

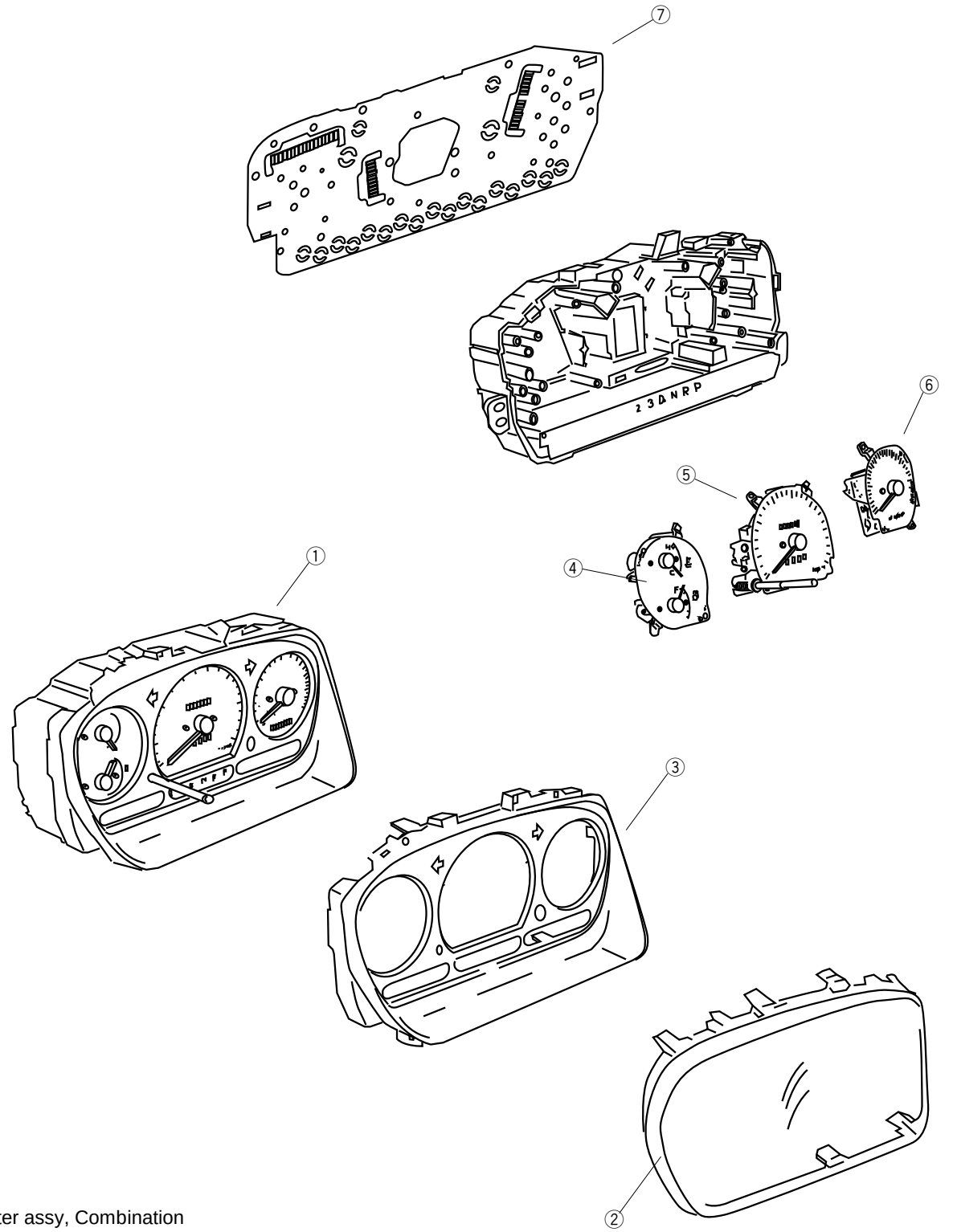
	AM	ACC	IG1	IG2	ST
LOCK					
ACC	○	○			
ON	○	○	○	○	
START	○		○	○	○



JBE00024-00203

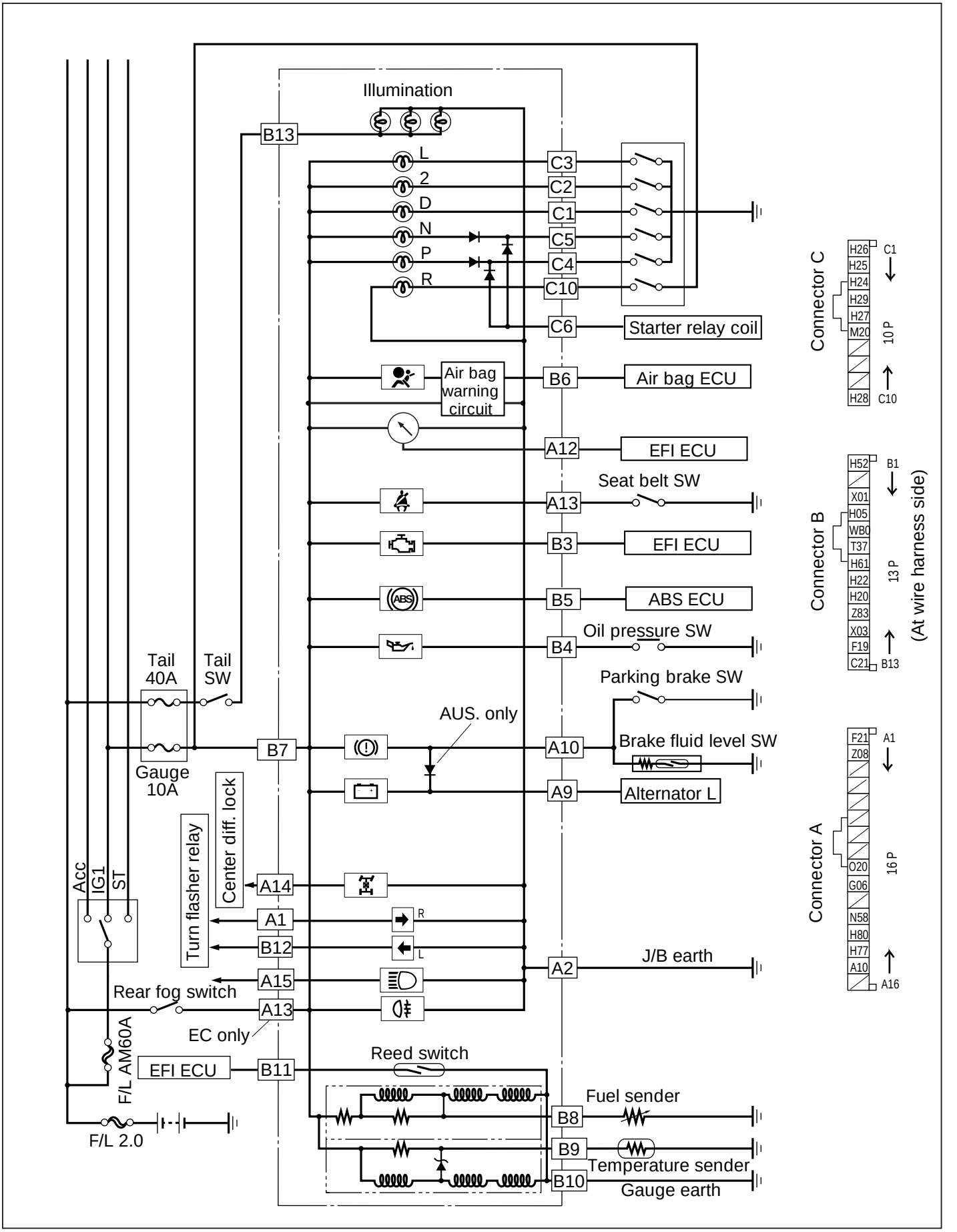
COMBINATION METER

CONSTRUCTION



① Meter assy, Combination
② Glass, Front
③ Plate, window
④ Gauge, water temperature & Fuel
⑤ Speedometer
⑥ Tachometer
⑦ Plate, Circuit meter

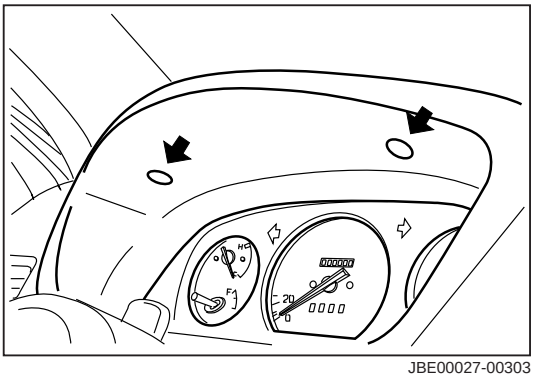
WIRING DIAGRAM



JBE00026-00302

Removal of combination meter

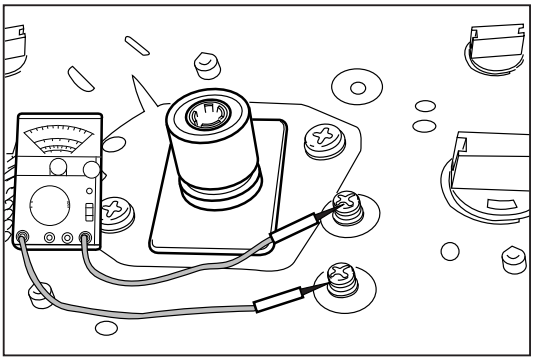
1. Pull of the hazard warning switch knob.
2. Remove the instrument cluster finish panel from the instrument panel by removing the screws.
3. Remove the attaching screws of the combination meter assembly.
4. Disconnect the speedometer cable and wire harness coupler at the back side of the combination meter assembly.
5. Remove the combination meter assembly.



JBE00027-00303

SPEED SENSOR

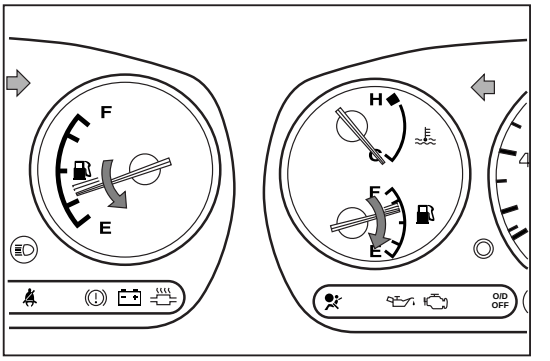
1. With a circuit tester set to the ohmmeter range, connect the circuit tester between the terminal B10 and B11.
2. Turn the speedometer drive shaft.
3. Check to see if continuity exists.
   NOTE:
   - The continuity should be 4 times per each revolution of the speedometer drive shaft.



JBE00028-00304

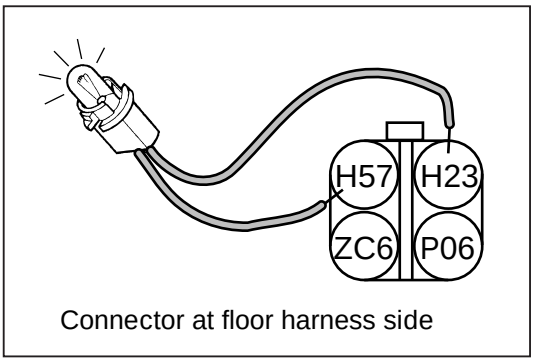
FUEL RECEIVER GAUGE

1. Jack up the vehicle.
2. Disconnect the connector from the fuel sender gauge/fuel pump assembly by the fuel tank.
3. Under this condition, turn on the ignition switch.
4. Ensure that the pointer of the receiver gauge returns to the position “E.”



JBE00029-00305

5. Turn off the ignition switch.
6. Connect the connector between the terminal H23 and H57 through a test lamp (12 V - 3.4 W).
7. Under this condition, turn on the ignition switch.
8. Ensure that the pointer of the receiver gauge rises gradually and resisters the position “F.”
9. Turn off the ignition switch.
10. Ensure that the pointer of the receiver gauge remains stationary and registers the position “F.”
    NOTE:
    - If not, check the wire harness and the fuel sender gauge.

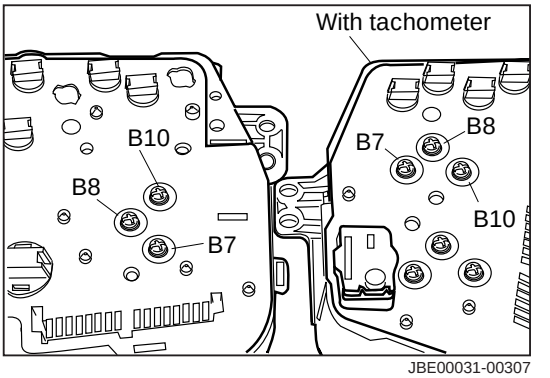


Connector at floor harness side

JBE00030-00306

Unit check

1. Remove the combination meter.
2. Measure the resistance between the terminals.
   Specified Resistance: B7 - B8 approx. 127 Ω
   B7 - B10 approx. 286 Ω
   B8 - B10 approx. 160 Ω

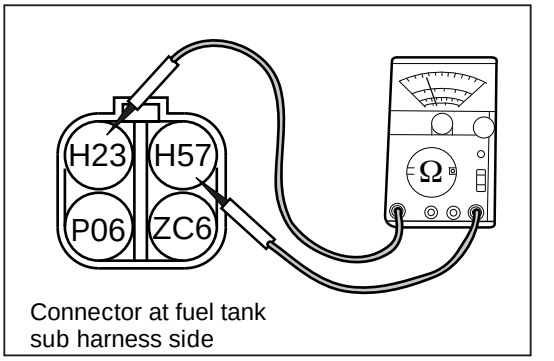


JBE00031-00307

FUEL SENDER GAUGE

1. Jack up the vehicle.
2. Disconnect the connector of the wire harness from the sender gauge/fuel pump assembly by the fuel tank.
3. Connect a circuit tester between the terminal H23 and H57.
4. Ensure that the resistance conforms to the standard value for float position specified in the table.

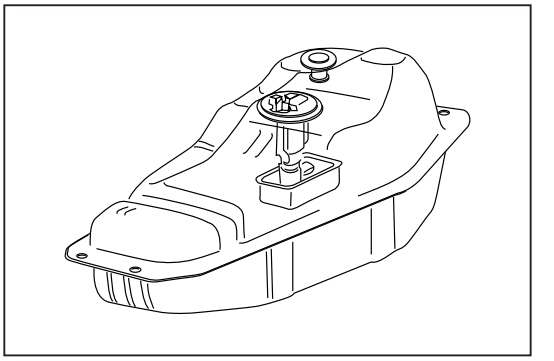
Float position	Resistance (Ω)
F	3 ± 2
E	120 ± 7



JBE00032-00308

Replacement

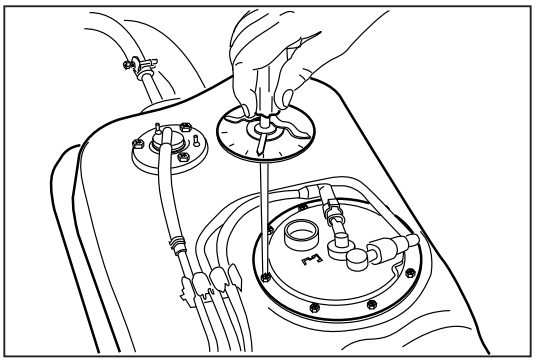
1. Remove the fuel tank.
   Refer to the BO section of the service manual.
   WARNING:
   - Never allow any fire to be brought near the working site.


JBE00033-00309

2. Remove the fuel sender gauge by removing the screws.

Installation

1. Place a new gasket on the fuel tank.
   WARNING:
   - Be sure to replace the fuel sender gauge gasket with new one. Failure to observe this caution may cause fire.


JBE00034-00310

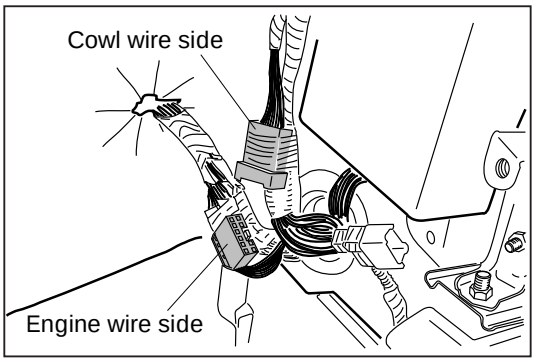
2. Install the fuel sender gauge to the fuel tank.
   Tightening Torque: 1.5 - 2.5 N·m

3. Install the fuel tank to the body.
   Refer to the BO section of the service manual.

WATER TEMPERATURE RECEIVER GAUGE

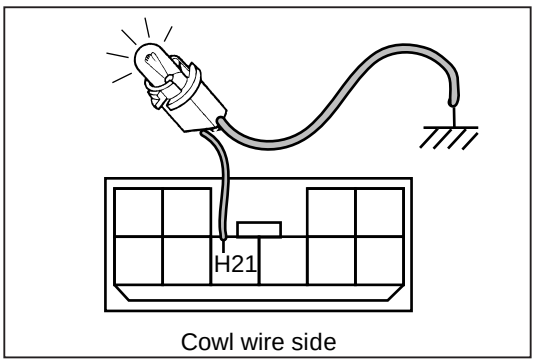
In-Vehicle inspection

1. Disconnect the connector of the engine wire harness from the cowl wire harness at the back side of the glove compartment.



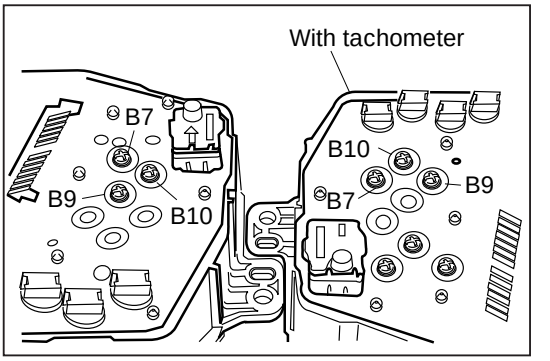
JBE00035-00311

2. Ground the terminal at the cowl wire harness side through a test lamp (12 V - 3.4 W).
3. Turn on the ignition switch. Ensure that the test lamp goes on and the pointer of the receiver gauge starts to rise gradually.



JBE00036-00312

4. Remove the combination meter, measure the resistance between the terminals.
   Resistance: B7 - B9: approx. 54 Ω
   B7 - B10: approx. 177 Ω
   B9 - B10: approx. 231 Ω

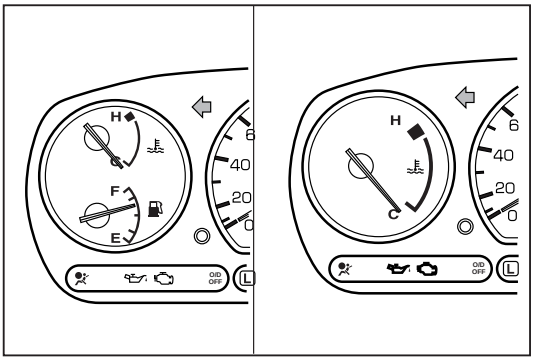


JBE00037-00313

WATER TEMPERATURE SENDER GAUGE

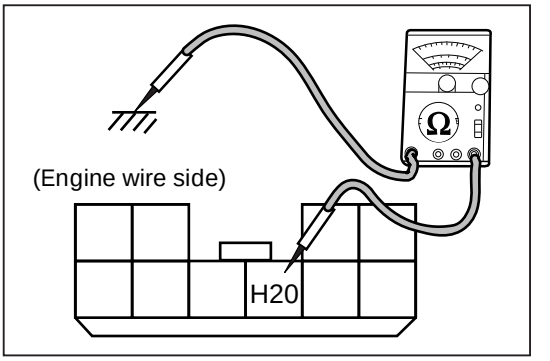
In-Vehicle inspection

1. Disconnect the connector of the engine wire harness from the cowl wire harness at the back side of the glove compartment.
2. Under this condition, turn on the ignition switch. Ensure that the pointer of the receiver gauge indicates lowest position.


JBE00038-00314

3. Turn off the ignition switch, Ground the terminal at the engine wire harness side through a circuit tester.
4. Ensure that the resistance conforms to the standard value in the table.
   NOTE:
   - If not, check the wire harness and the water temperature sender gauge.

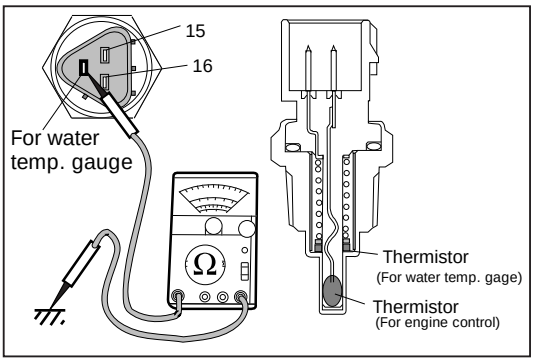
Temperature (°C)	Resistance (Ω)
50	190 - 260
115	24 - 28



JBE00039-00315

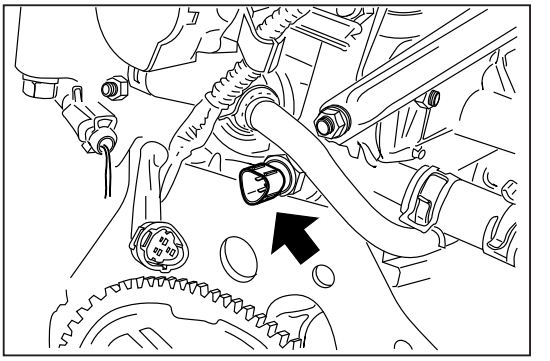
Unit check

1. Remove the engine cylinder head.
   Refer to the EM section of the service manual.
2. Remove the sender gauge.
3. Measure the resistance between the terminals as in the illustration.



JBE00040-00316

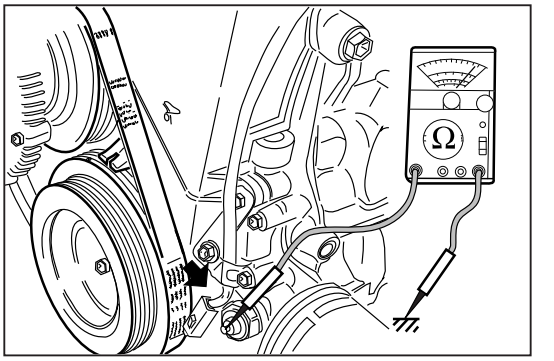
4. Clean the threaded portion of new water temperature sender gauge. Wind seal tape around the threaded portion.
5. Install the sender gauge.
   Tightening Torque: 24.5 - 34.3 N·m


JBE00041-00317

LOW OIL PRESSURE WARNING

Unit inspection

1. Disconnect the connector from the warning switch.
2. Connect a ohm meter. Ensure that continuity exists between the oil pressure switch terminal and the ground while the engine is stopped, whereas no continuity exists while the engine is running.
   NOTE:
   - If not, replace the unit.
     Refer to the LU section of the service manual.

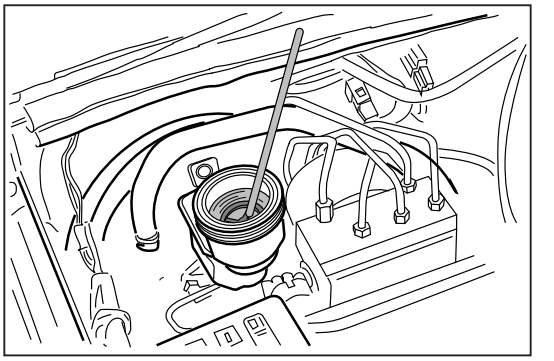


JBE00042-00318

BRAKE FLUID LEVEL WARNING

Unit inspection

1. Disconnect the connector.
2. Connect an ohm meter.
3. Remove the reservoir tank cap. Press down the float with a clean rod. Ensure that continuity exists.
   NOTE:
   - As for a rod to be used for pressing down the float, be sure to thoroughly clean it. Special care must be exercised to ensure that no dust nor water gets into the reservoir.

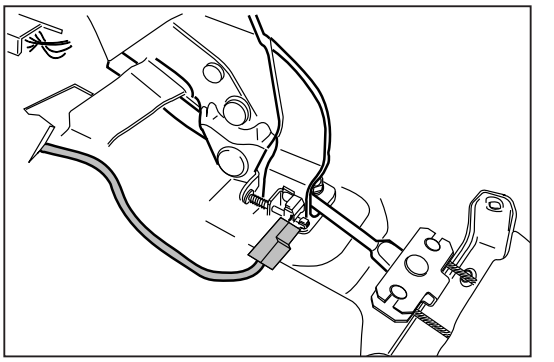


JBE00043-00319

PARKING BRAKE WARNING

Unit inspection

1. Disconnect the connector from the parking brake switch.
2. Ensure that the parking brake warning lamp or brake warning lamp goes on when ground the terminal at the harness side.
3. Ensure that continuity exists between the terminal and the body earth when the parking brake lever is pulled up ward.



JBE00044-00320

REAR FOG LAMP WARNING

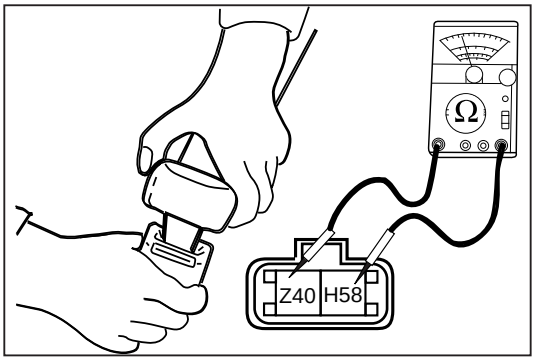
Refer to rear fog lamp system.

JBE00045-00321

SEAT BELT WARNING

Unit inspection

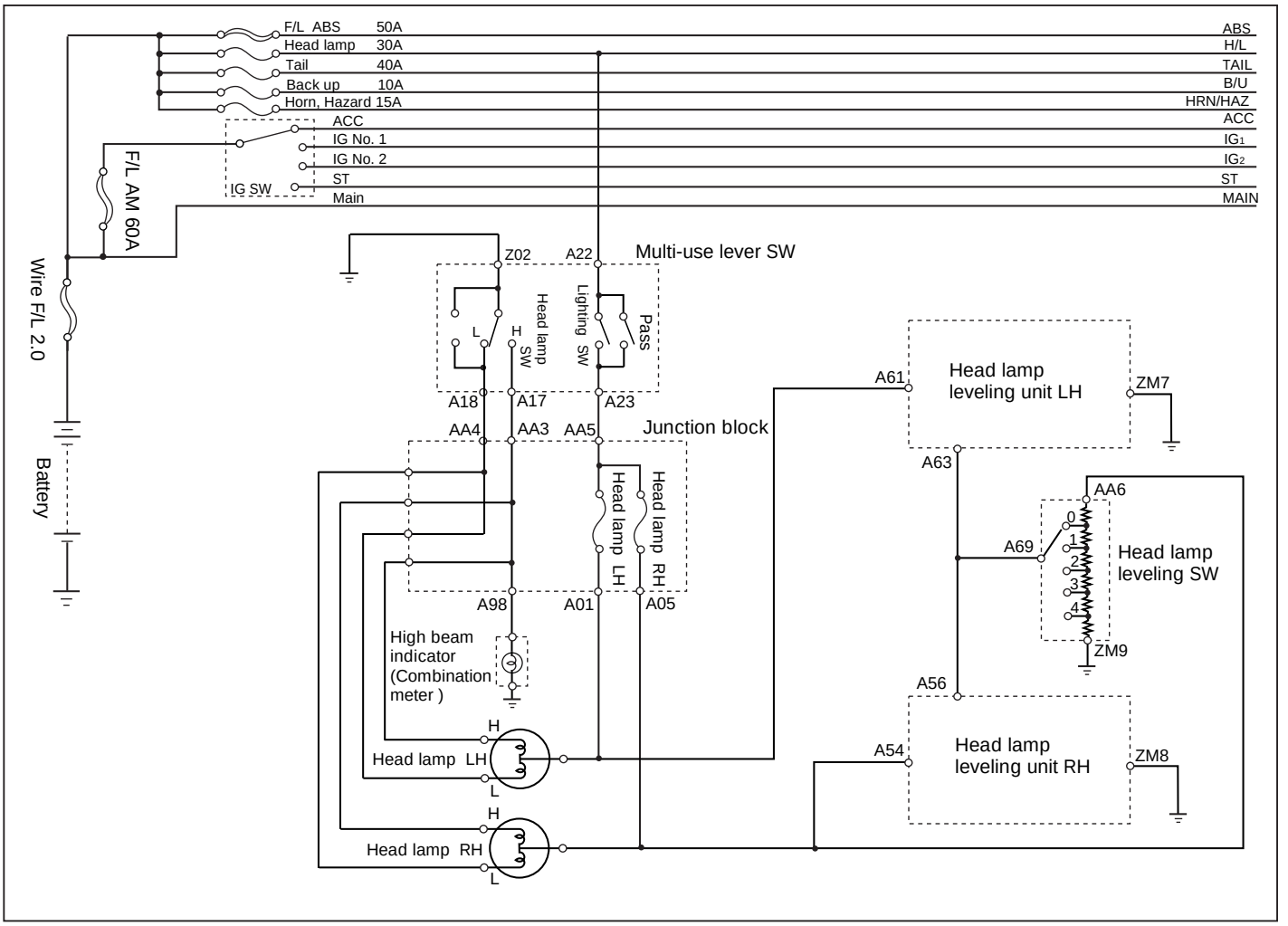
1. Disconnect the connector of the seat belt buckle.
2. Ensure that the seat belt warning glows when short the terminal at the harness side and the body earth.
3. Ensure that continuity exists between the terminals of the buckle side.
4. Ensure that no continuity exists when insert the tongue plate into the buckle until it clicks.



JBE00046-00322

HEAD LAMP

WIRING DIAGRAM

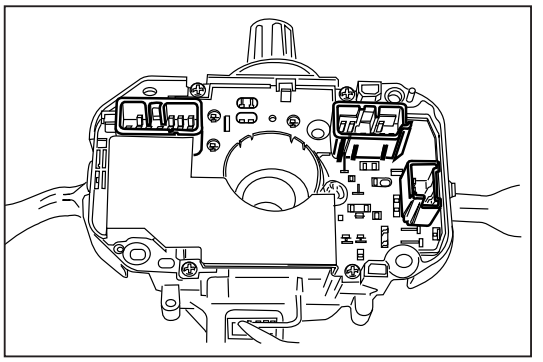


JBE00047-00401

HEAD LAMP SWITCH (with air bag system)

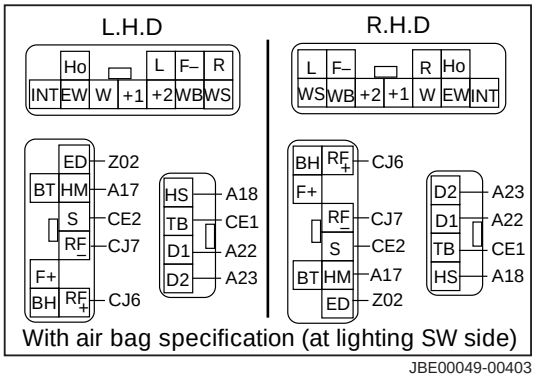
Unit inspection

Disconnect the connector for multi-use lever switch. Ensure that continuity exists between the respective terminals in accordance with the following continuity table.



JBE00048-00402

		HM	HS	ED	TB	S	(RF+)	(RF–)	D1	D2
OFF	HF	○		○					○	○
	HL		○	○						
	HU	○		○						
I	HF	○		○	○	○			○	○
	HL		○	○	○	○				
	HU	○		○	○	○				
II	HF	○		○	○	○	○	○	○	○
	HL		○	○	○	○	○	○	○	○
	HU	○		○	○	○	○	○	○	○



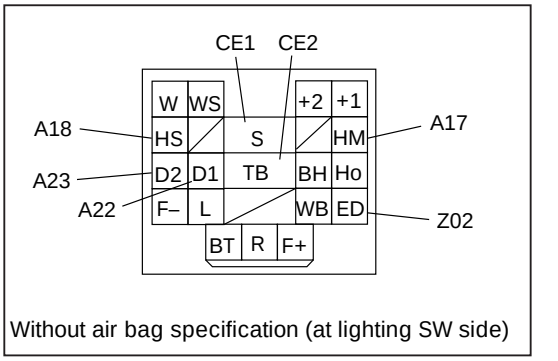
JBE00049-00403

HEAD LAMP SWITCH (without air bag system)

Unit inspection

Disconnect the connector for multi-use lever switch. Ensure that continuity exists between the respective terminals in accordance with the following continuity table.

		HM	HS	ED	TB	S	D1	D2
OFF	HF	○		○			○	○
	HL							
	HU							
I	HF	○		○	○	○	○	○
	HL				○	○		
	HU				○	○		
II	HF	○		○	○	○	○	○
	HL		○	○	○	○	○	○
	HU	○		○	○	○	○	○



Without air bag specification (at lighting SW side)

JBE00050-00404

JBE00051-00405

Aiming adjustment

Perform the following operation in advance.

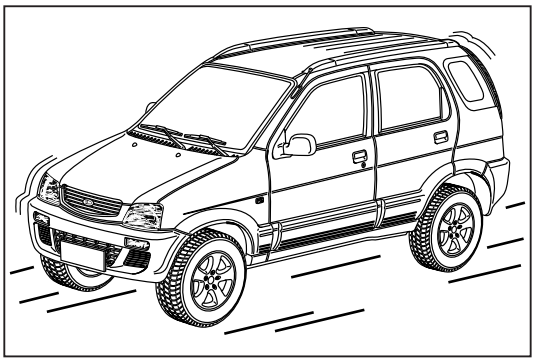
1. Seat one person (weighing about 75 kg) at the driver's seat.
2. Set the tire inflation pressure to the specified values.
3. Ensure that a spare tire, tools, a jack are mounted at the specified points.
4. Check to see if the engine oil, transmission oil, window washer fluid, etc. are filled to the specified levels. Fill them, as required. Further more, fuel in the tank is filled up.

kPa

Tire size	Tire air pressure	
	Front	Rear
205/70R15	200	

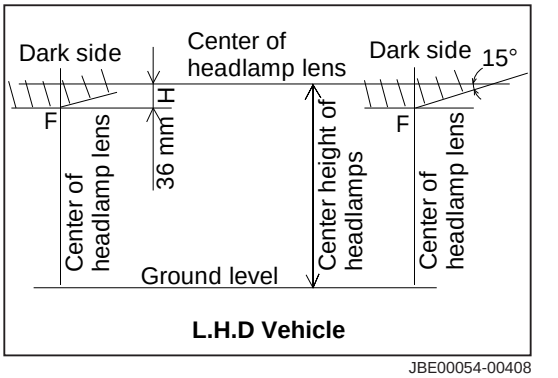
JBE00052-00406

5. Rock the vehicle in up-&-down and right-&-left directions so that the suspensions may support the load evenly and the vehicle may assume the proper vehicle posture.
   NOTE:
   - In case of a vehicle which has the head lamp leveling system, perform this aiming adjustment with the leveling control switch set to the "0" position.



JBE00053-00407

6. Setting of reference points on screen
   (1) Measure the center height "H" of the head lamps.
   (At 3 m from lens surface)
   Draw an adjustment line on the screen at;
   L.H.D. vehicle:
   31 mm below the center height "H"
   R.H.D. vehicle:
   31 mm below the center height "H"
   Vehicle with head lamp leveling system:
   36 mm below the center height "H"

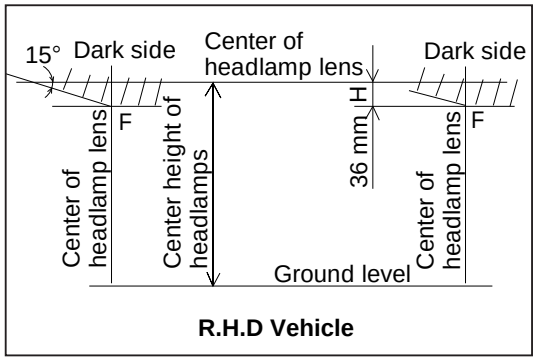


L.H.D Vehicle

JBE00054-00408

NOTE:
- Keep the engine speed at 1500 rpm or more during the aiming adjustment.

(2) Draw a vertical straight line on the screen at each center of the head lamps on both right and left sides.
Thus, establish each intersection “F” made by the vertical center line and the adjustment line.

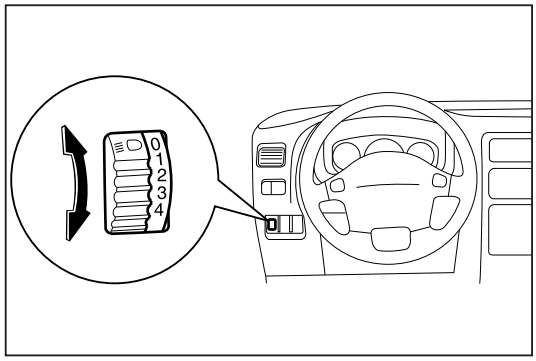


R.H.D Vehicle

JBE00055-00409

(3) Ensure that the optical axis moves down ward when the head lamp leveling switch is turned 0-1-2-3-4.

Position	Stroke
0 – 1	28 mm
1 – 2	28 mm
2 – 3	28 mm
3 – 4	28 mm

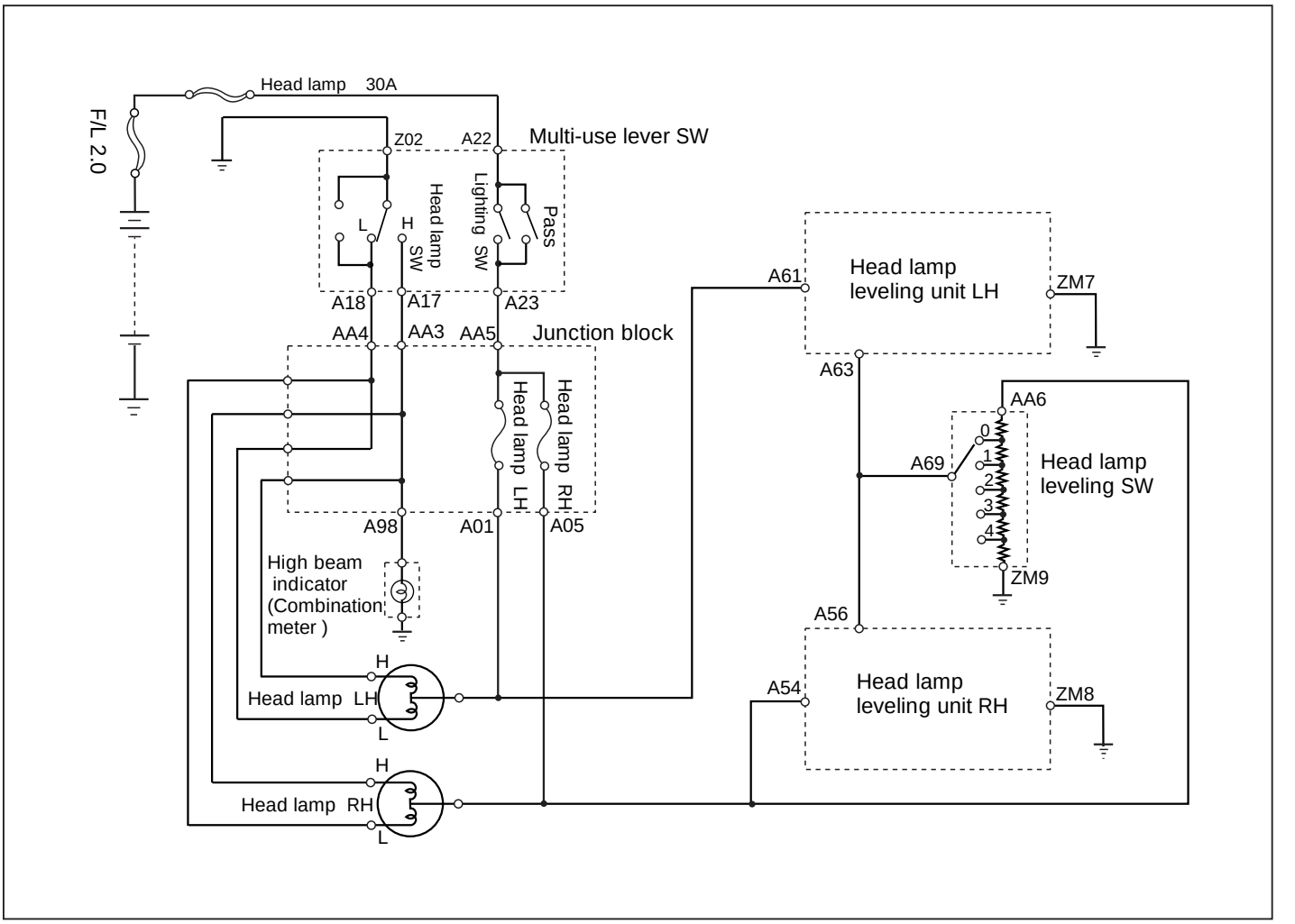


JBE00056-00410

NOTE:
- The head lamp leveling system functions only when the head lamp switch is turned on.

HEAD LAMP LEVELING

WIRING DIAGRAM

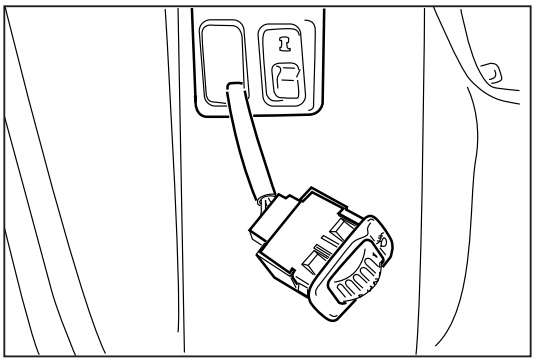


JBE00057-00501

HEAD LAMP LEVELING SWITCH

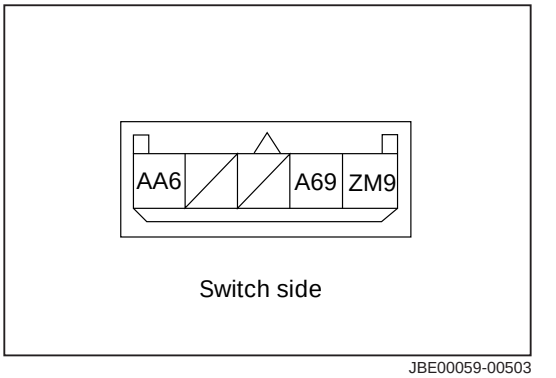
Unit inspection

1. Remove the head lamp leveling switch by pushing it with your fingers at the back side of the instrument panel.
2. Disconnect the connector of the wire harness.
3. Remove the switch assembly from the instrument panel.



JBE00058-00502

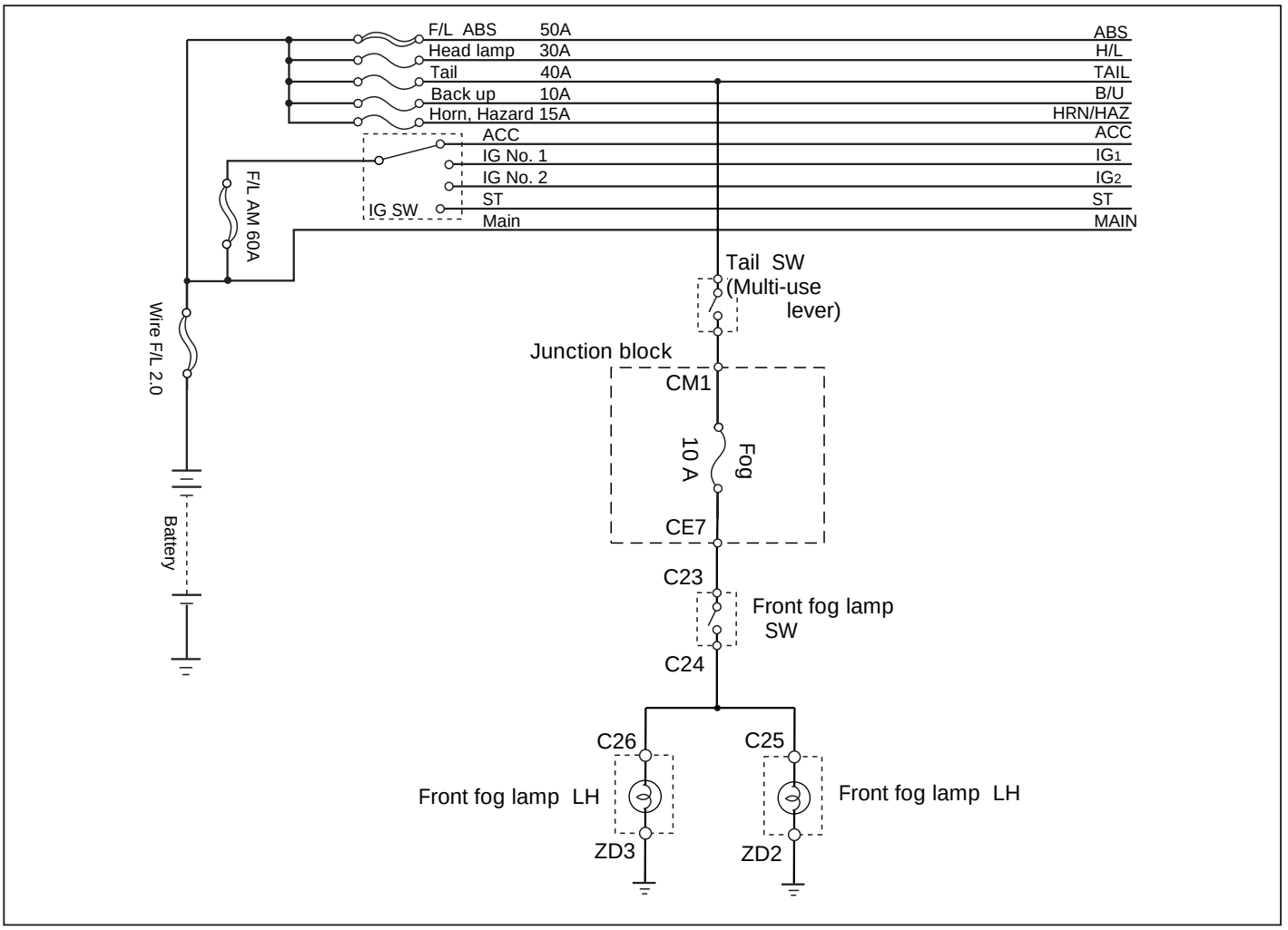
4. Ensure the resistance between the respective terminals conforms to the following specifications.
   - Between A69 and ZM9 (Position 0); Approx. 2.0 kΩ
   - Between A69 and ZM9 (Position 1); Approx. 1.7 kΩ
   - Between A69 and ZM9 (Position 2); Approx. 1.6 kΩ
   - Between A69 and ZM9 (Position 3); Approx. 1.4 kΩ
   - Between A69 and ZM9 (Position 4); Approx. 1.2 kΩ
   - Between AA6 and ZM9 (Each position); Approx. 2.4 kΩ



JBE00059-00503

FRONT FOG LAMP

WIRING DIAGRAM

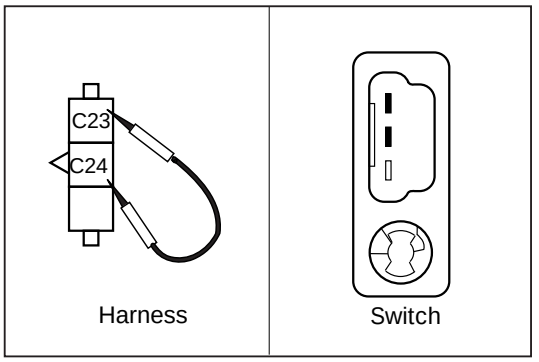


JBE00060-00601

FRONT FOG LAMP SWITCH

Unit inspection

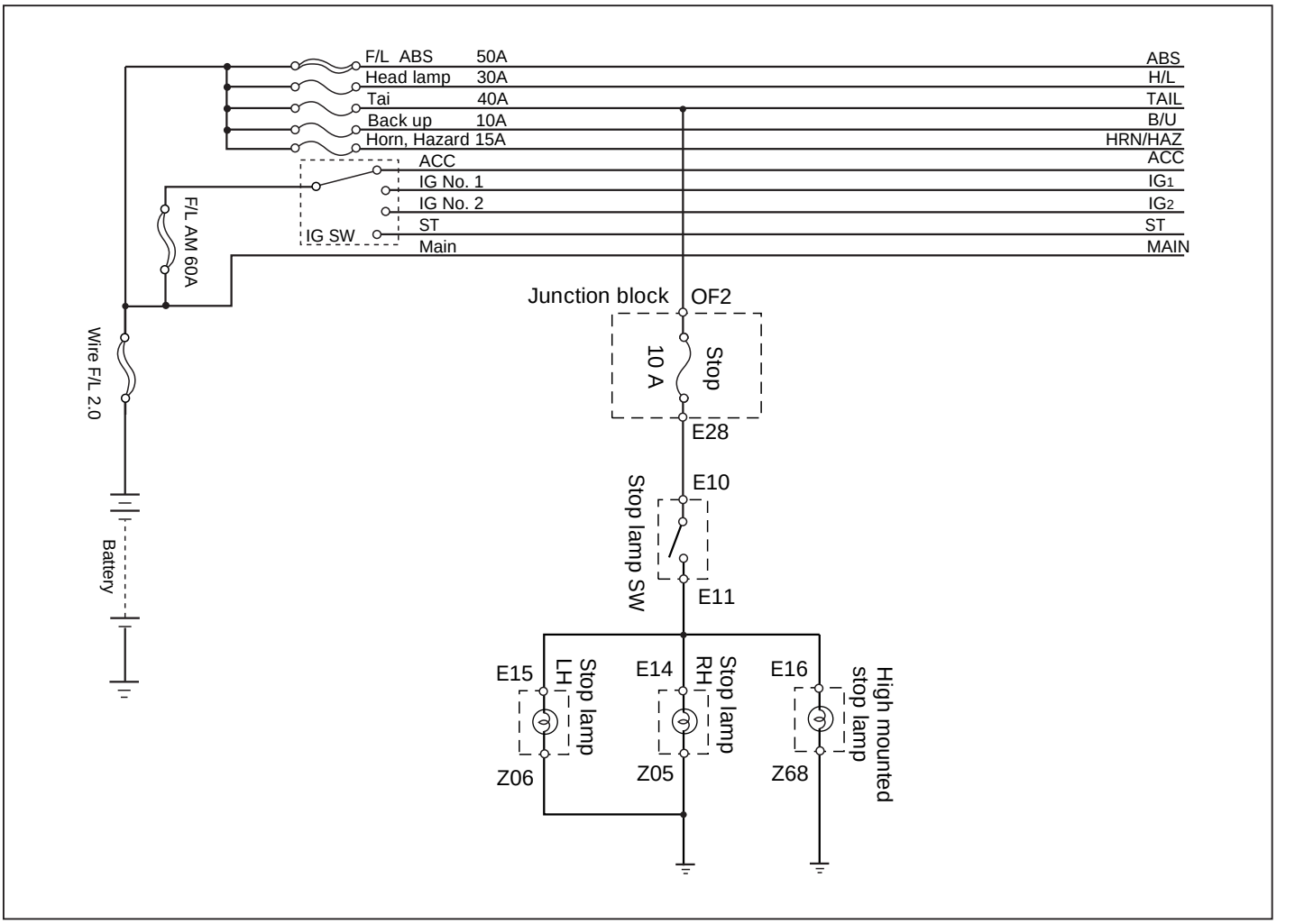
1. Pull out the switch assembly from the instrument panel. Disconnect the connector.
2. Ensure that the continuity exists between the terminals of the front fog lamp switch while the switch is turned on.



JBE00061-00602

STOP LAMP

WIRING DIAGRAM

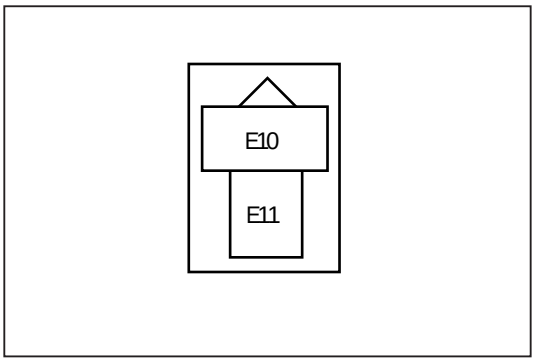


JBE00062-00701

STOP LAMP SWITCH

Unit inspection

1. Disconnect the connector of the stop lamp switch. (at the brake pedal arm)
2. Ensure that continuity exists between the terminals when the brake pedal is depressed.
3. Ensure that no continuity exists between the terminals when the brake pedal is not depressed.



JBE00063-00702

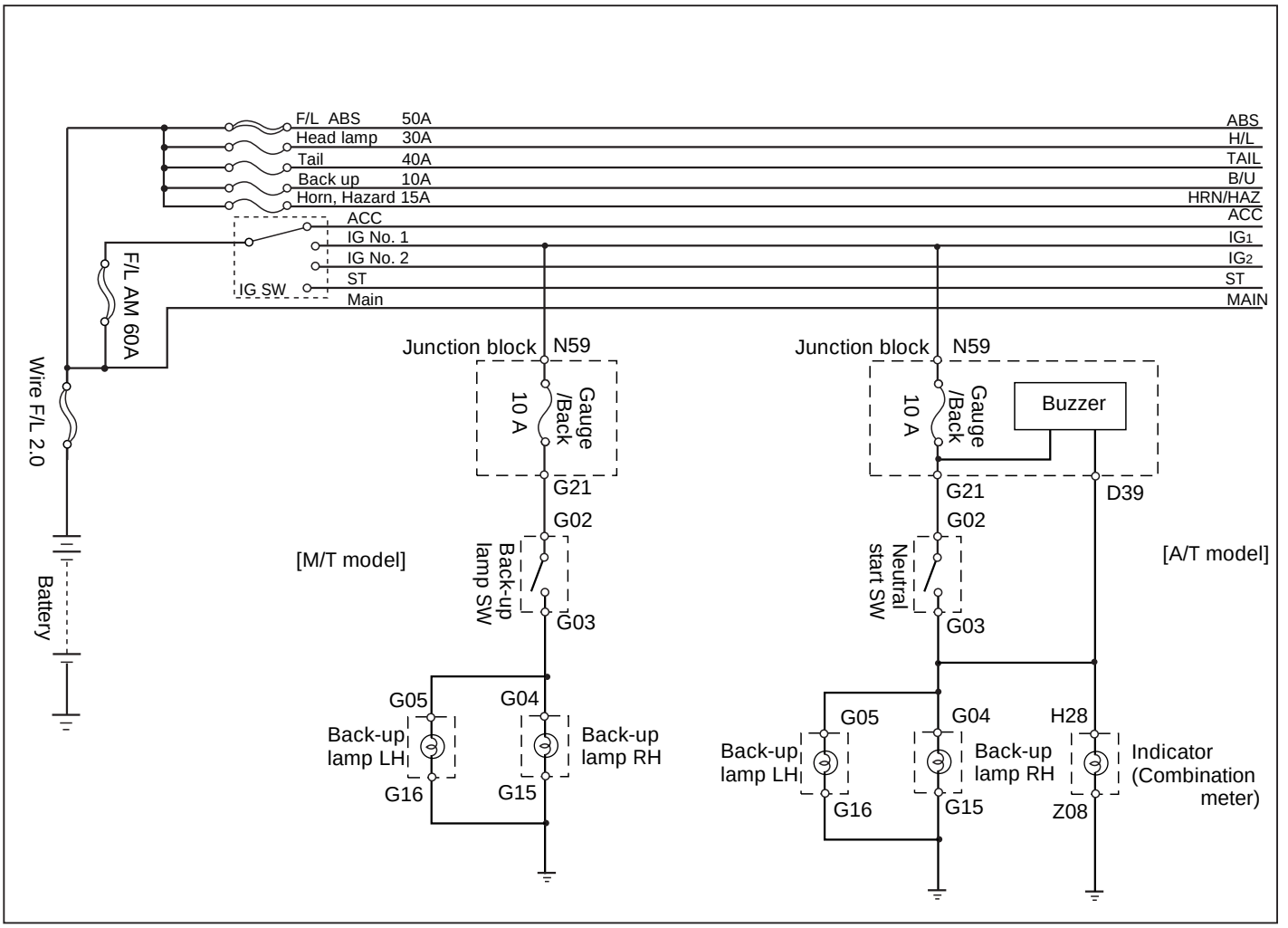
Removal and installation

Refer to the BR section of the service manual.

JBE00064-00703

BACK UP LAMP

WIRING DIAGRAM



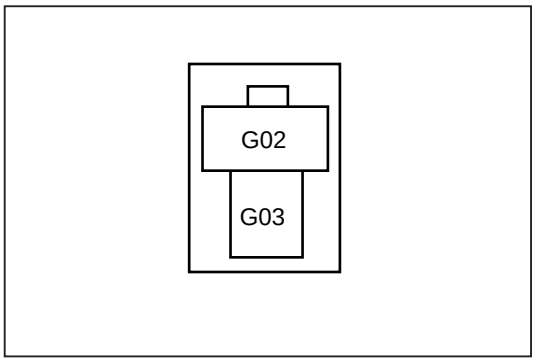
JBE00065-00801

BACK UP LAMP SWITCH

Unit inspection

(Manual transmission)

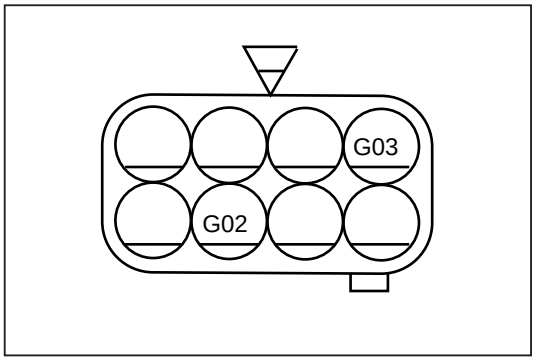
1. Disconnect the connector of the back up lamp switch. (on the transmission case)
2. Ensure that continuity exists between the terminals when shift lever of the manual transmission is shifted to the reverse position.



JBE00066-00802

(Automatic transmission)

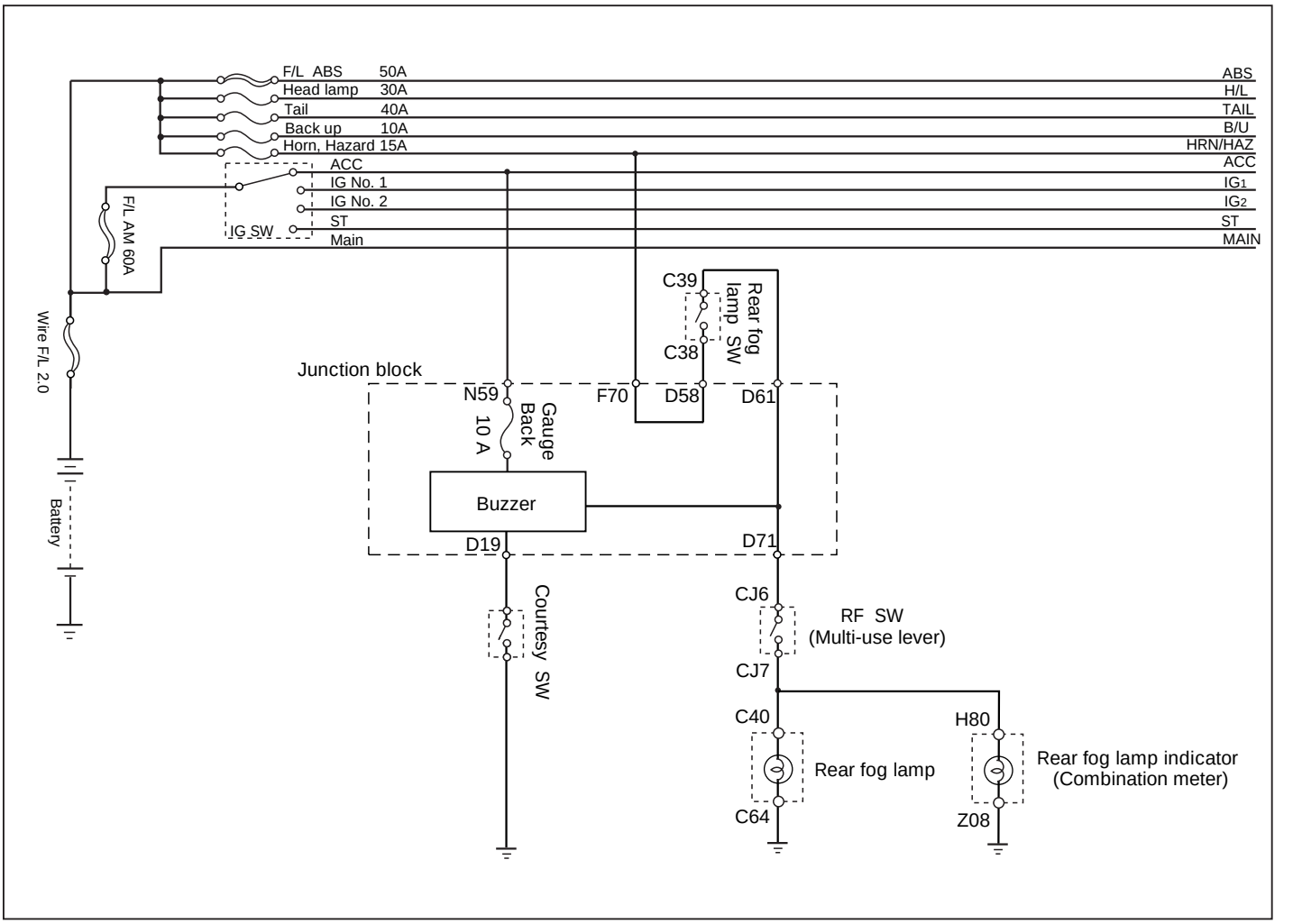
1. Disconnect the connector of the transmission neutral switch. (on the transmission case)
2. Ensure that continuity exists between the terminals when shift lever of the automatic transmission is shifted to the reverse position.



JBE00067-00803

REAR FOG LAMP

WIRING DIAGRAM

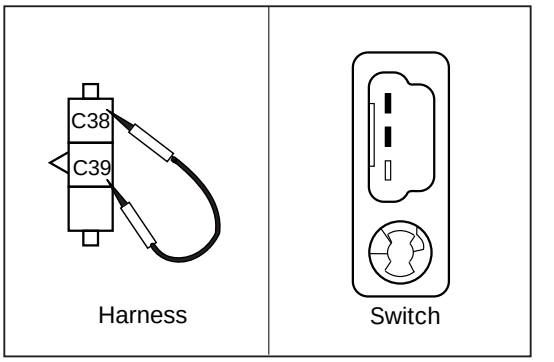


JBE00068-00901

REAR FOG LAMP SWITCH

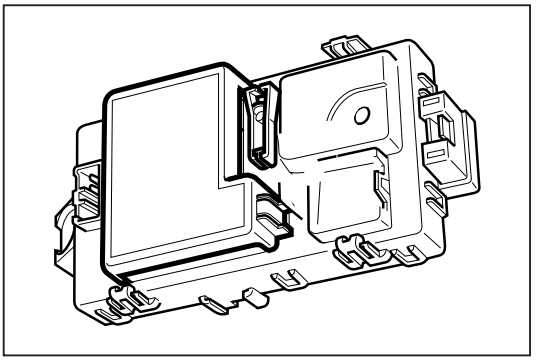
Unit inspection

1. Pull out the switch assembly from the instrument panel. Disconnect the connector.
2. Ensure that the rear fog lamp warning glows when ignition switch turns on and short the terminals at the harness side.
   If not glows the warning, check the wire and meter assembly.
3. Ensure that the continuity exists between the terminals of the rear fog lamp switch while the switch is turned on.



JBE00069-00902

REAR FOG LAMP WARNING BUZZER



JBE00070-00904

In-vehicle inspection

1. Ensure if the warning buzzer is set off under the conditions given following table.

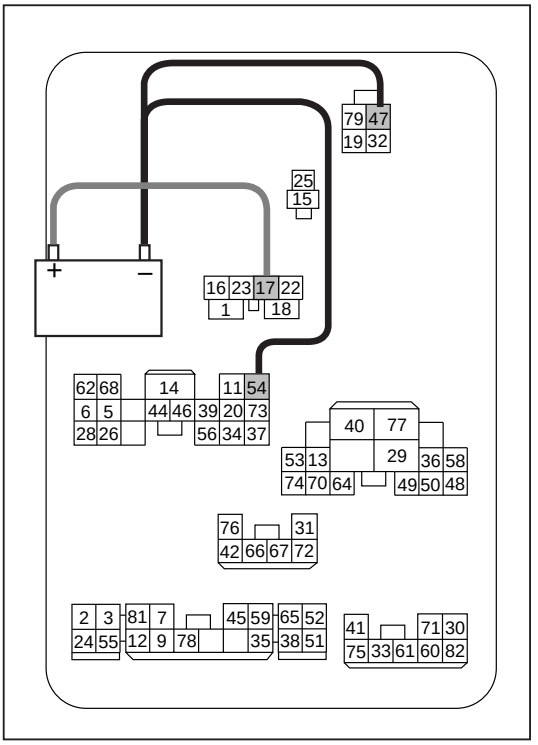
Ignition SW	Front door	Rear fog lamp SW	Buzzer
OFF / Acc	Open	On	Set off
		Off	—
	Close	On	—
		Off	—
ON	Open	On	—
		Off	—
	Close	On	—
		Off	—

2. If not, check the wiring harness and warning buzzer.

JBE00071-00905

Unit inspection

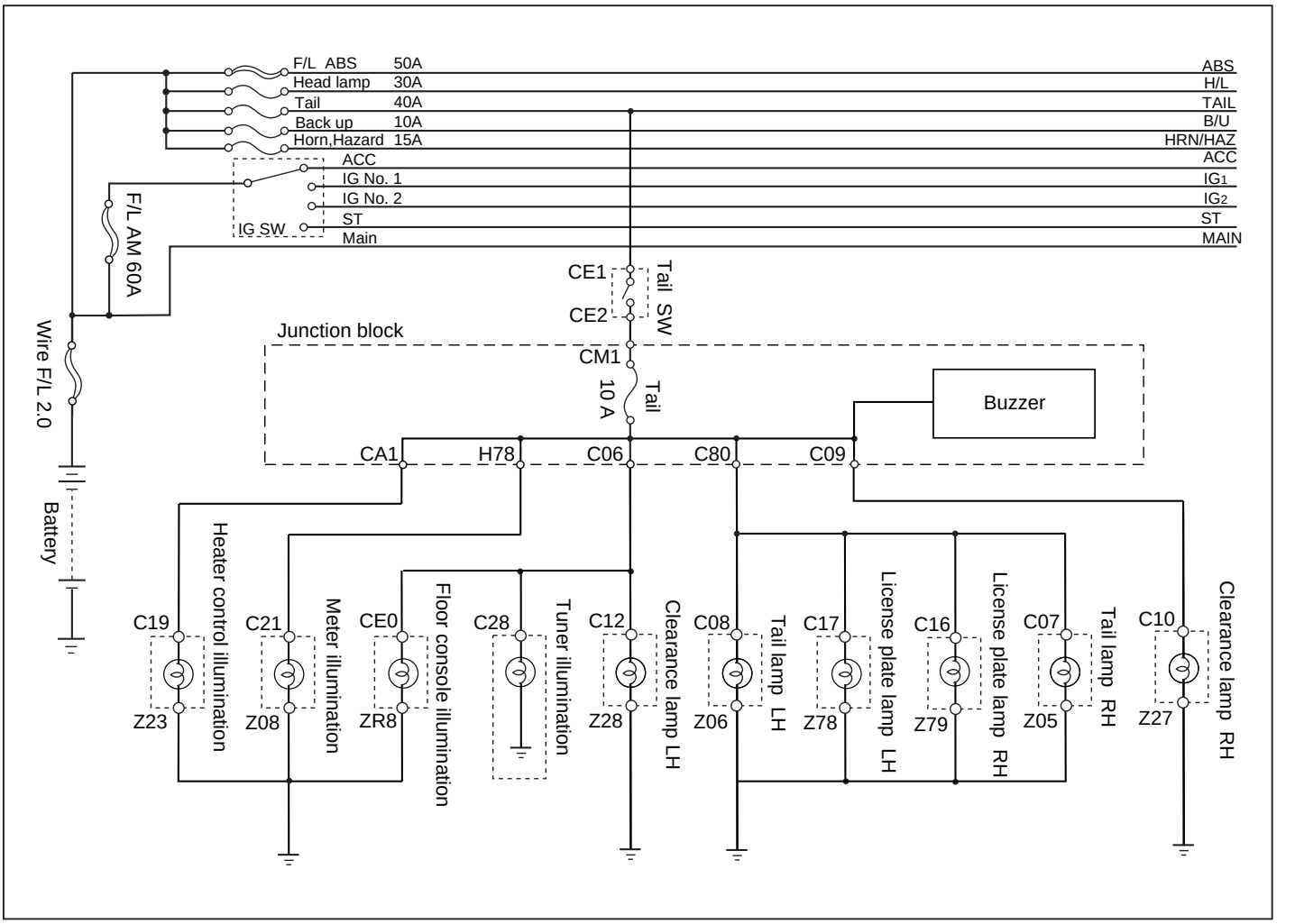
1. Disconnect the connectors and remove the junction block by removing attaching bolts.
2. Apply a battery voltage to the terminal 17 (+) and the terminal 47 (–).
3. Check that the warning buzzer will set off when the battery (+) (or the terminal 47) is connected to the terminal 54 with a jump wire.



JBE00072-00906

TAIL LAMP & LICENSE PLATE LAMP

WIRING DIAGRAM

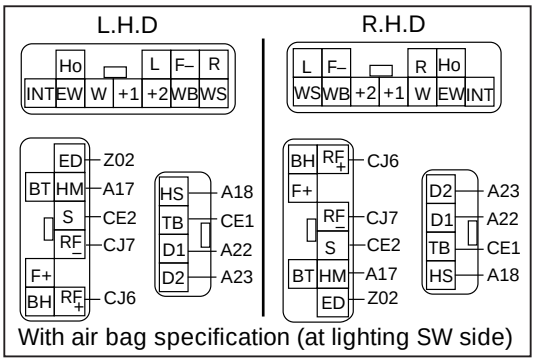


JBE00073-01001

TAIL LAMP SWITCH

Unit inspection

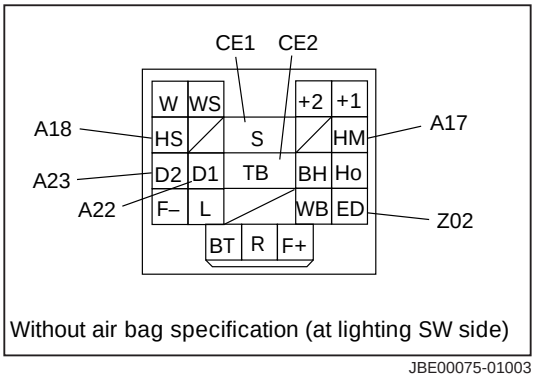
Disconnect the connector of the multi-use lever switch. Ensure that continuity exists between the respective terminals in accordance with the following continuity table.



With air bag specification (at lighting SW side)

JBE00074-01002

		TB	S
OFF	HF		
	HL		
	HU		
I	HF	○—○	
	HL	○—○	
	HU	○—○	
II	HF	○—○	
	HL	○—○	
	HU	○—○	

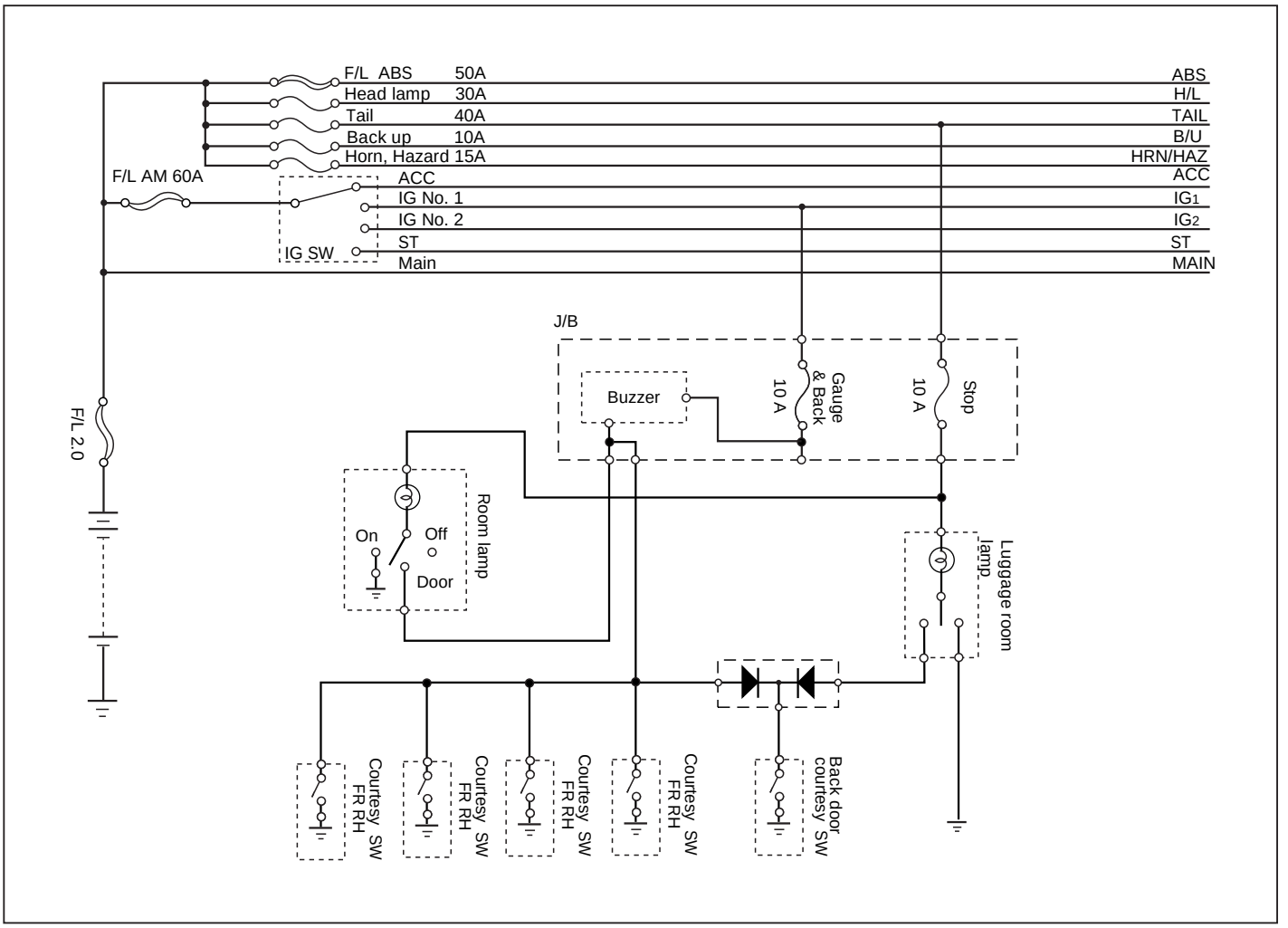


Without air bag specification (at lighting SW side)

JBE00075-01003

INTERIOR LAMP & LUGGAGE ROOM LAMP

WIRING DIAGRAM



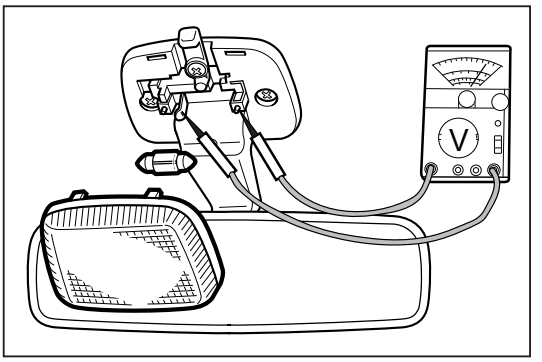
JBE00076-01101

INTERIOR LAMP SWITCH

Unit inspection

1. Lightly pry the lens to detach it and pull out the bulb straight.
2. Turns on the ignition switch.
3. Ensure if the voltage exists between the terminals when interior lamp switch is located to the respective position.

	Interior lamp switch position		
	Left	Center	Right
Front door open	—	Battery voltage	Battery voltage
Front door close	—	—	Battery voltage



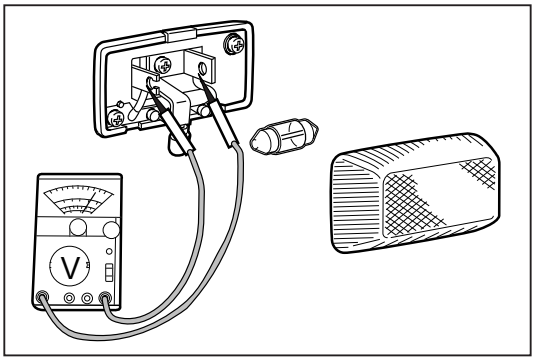
JBE00077-01102

LUGGAGE ROOM LAMP SWITCH

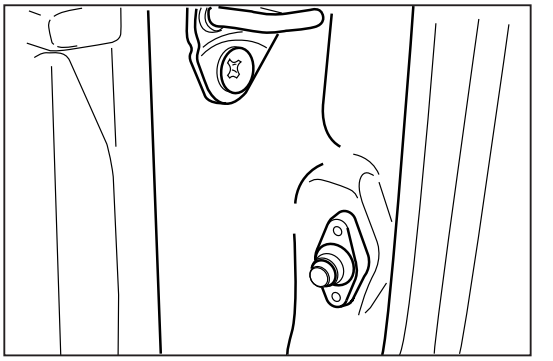
Unit inspection

1. Lightly pry the lens to detach it and pull out the bulb straight.
2. Turns on the ignition switch.
3. Ensure if the voltage exists between the terminals when the rear gate is opened.

Rear gate open	Battery voltage
Rear gate close	—



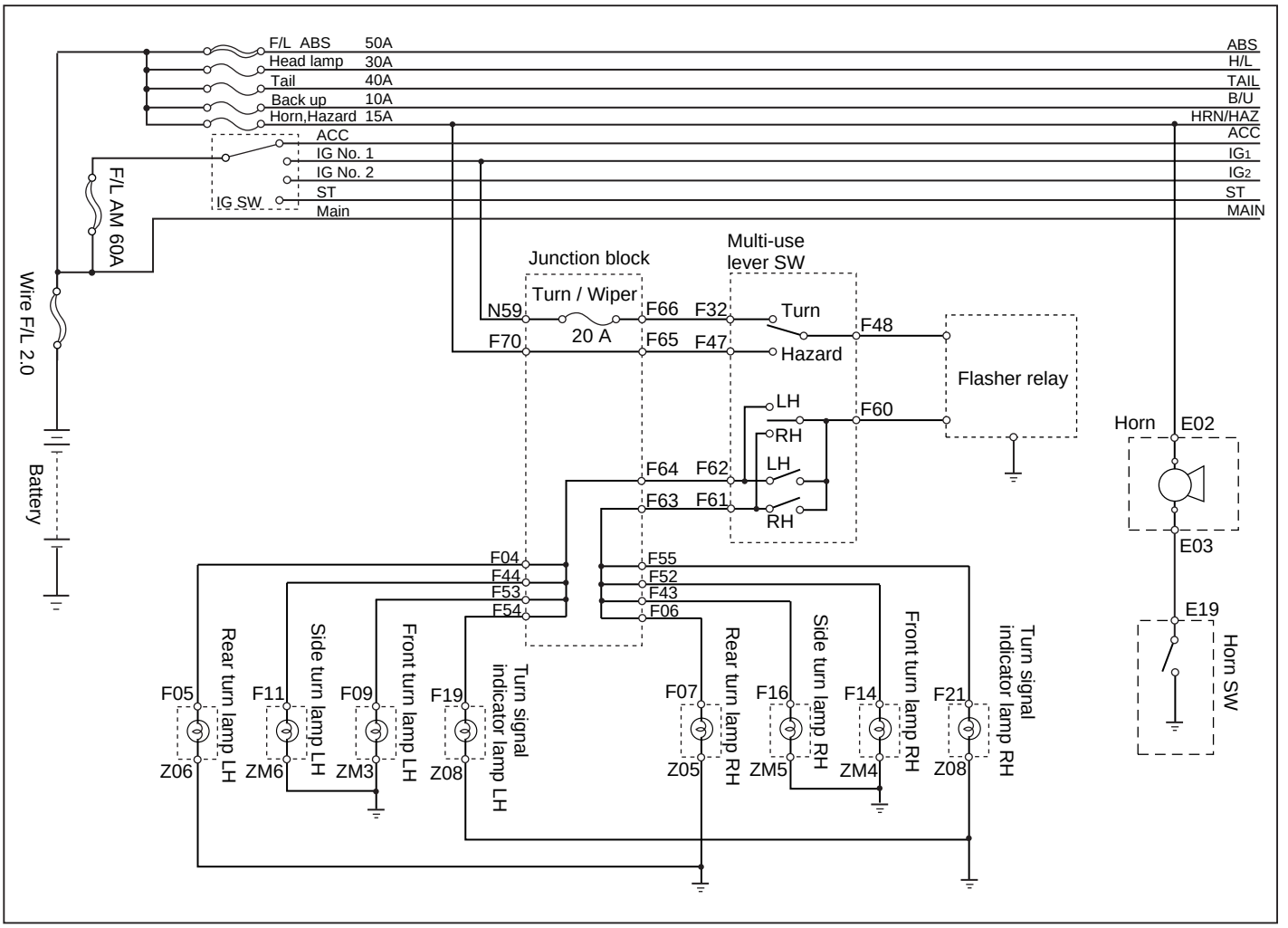
JBE00078-01104



JBE00000-01105

HAZARD WARNING & HORN

WIRING DIAGRAM



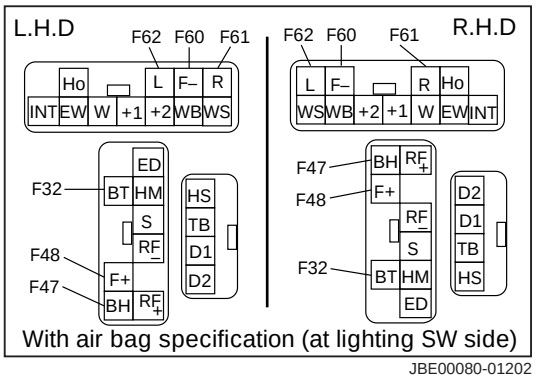
JBE00079-01201

HAZARD WARNING SWITCH

Unit inspection

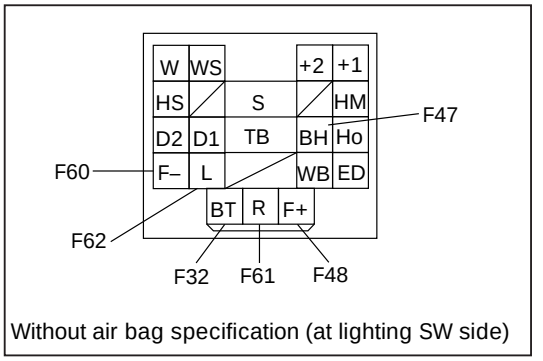
1. Disconnect the connector of the multi-use lever switch.
2. Ensure that continuity exists between the respective terminals in accordance with the following continuity table.

Hazard		F–	L	R	BT	BH	F+
OFF	L	○	○		○		○
	N				○		○
	R	○		○	○		○
ON		○	○	○		○	○



With air bag specification (at lighting SW side)

JBE00080-01202



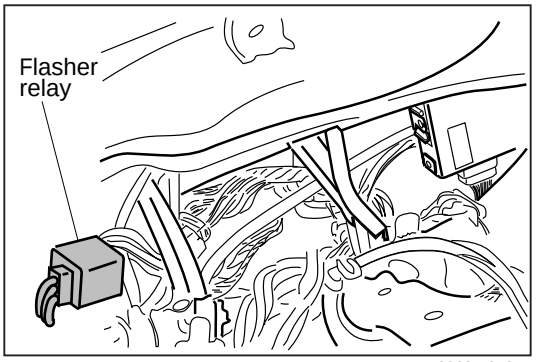
Without air bag specification (at lighting SW side)

JBE00000-01203

FLASHER RELAY

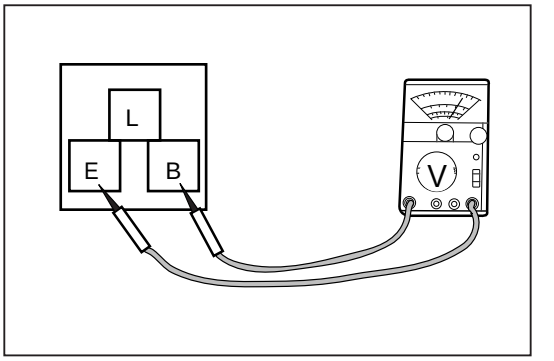
Unit inspection

1. Remove the combination meter. Then remove the flasher unit at the bracket of the cowl panel.
2. Disconnect the connector of the flasher unit.



JBE00081-01211

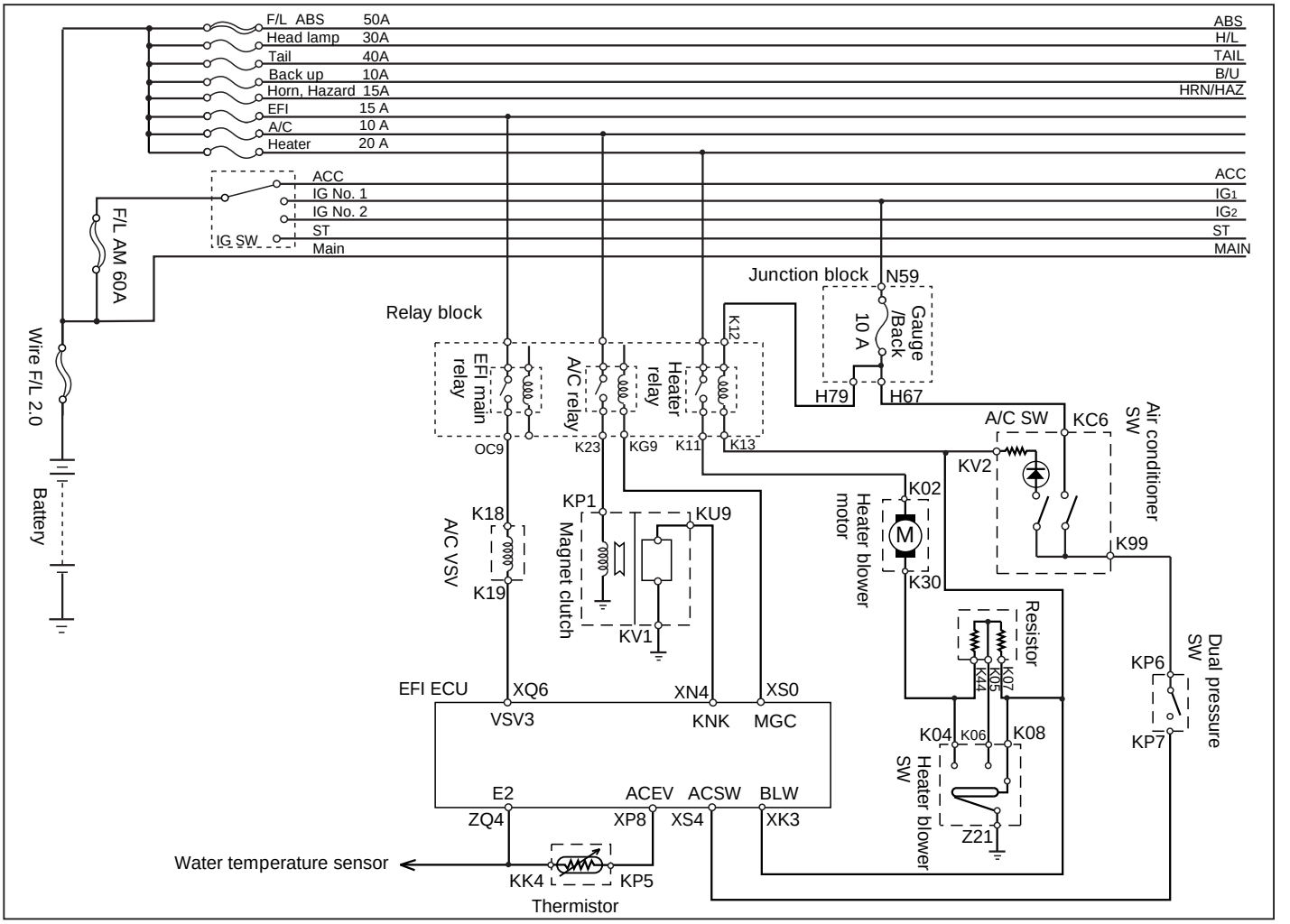
3. Ensure if the voltage exists the respective terminals at wire harness connector when ignition switch is turned on.
4. Ensure if the voltage exists the terminal when hazard switch is turned on.
5. Connect the flusher unit to the wire harness connector. Under the condition, if the flusher unit will not work, then the unit is failure.



JBE00082-01212

HATER & VENTILATION

WIRING DIAGRAM

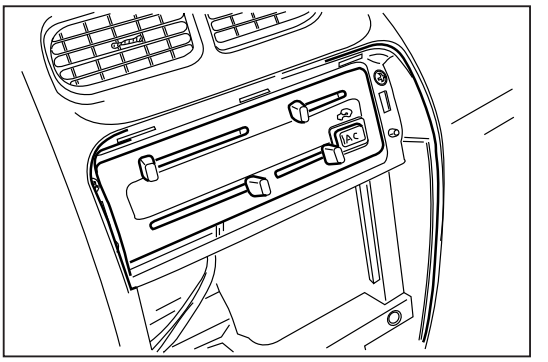


JBE00083-01301

BLOWER SWITCH

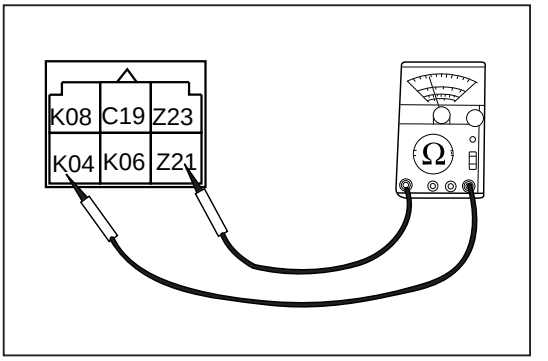
Unit inspection

1. Remove the instrument cluster finish center panel.
2. Remove the radio opening cover.
3. Remove the attaching screws of the heater control panel assembly.
   (Refer to the BO section of the service manual)
4. Disconnect the connector of the blower switch and the air conditioner switch.
5. Disconnect the control cables from the heater unit.
6. Remove the heater control panel assembly from the instrument panel.



JBE00084-01302

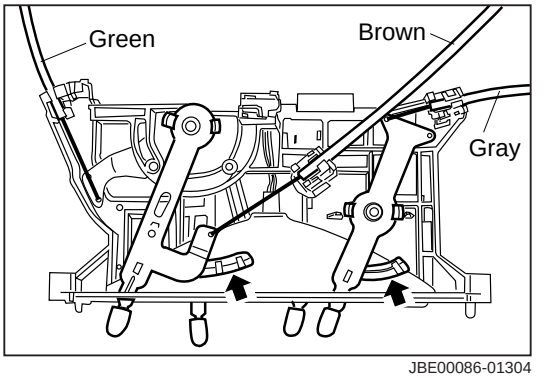
7. When the blower switch is set to each stage, ensure that continuity exists between the respective terminals as indicated in the table below.



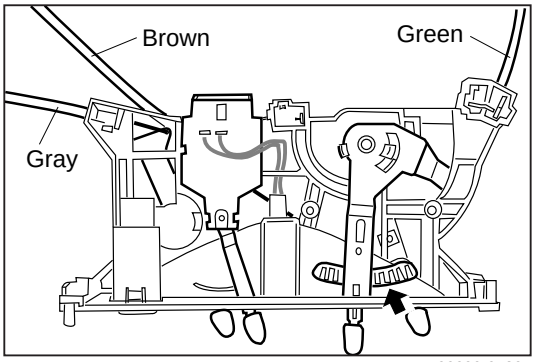
JBE00085-01303

	Z21	K08	K06	K04
OFF				
L	○	○		
M	○	○	○	
H	○	○		○

8. Ensure that each of the air outlet control lever, air intake control lever and temperature control lever is functioning smoothly with a positive dent feeling.
   NOTE:
   - If not, apply a rubber grease to the points or replace the control panel assembly.



JBE00086-01304

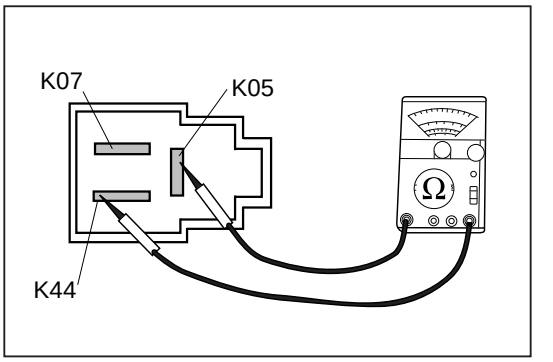


JBE00000-01305

BLOWER RESISTER

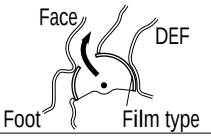
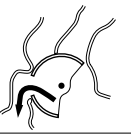
Unit inspection

1. Connect the connector of the the blower resistance.
2. Ensure that resistance between the respective terminals conforms to the following specifications.
   Between Terminal K44 and K07: 3.35 Ω
   Between Terminal K44 and K05: 1.1 Ω
   Between Terminal K07 and K05: 2.25 Ω



JBE00087-01311

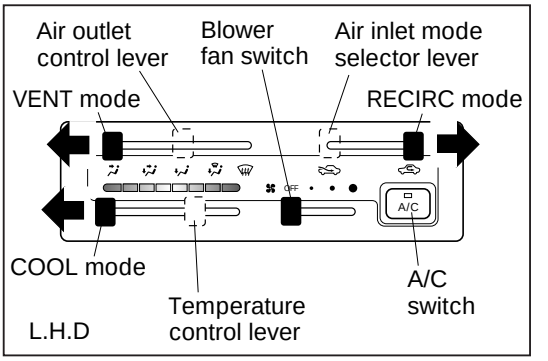
VENTILATION SYSTEM

Film type rotary door position					
	Face	Bi-level	Foot	Foot/DEF	DEF
Lever position					

JBE00088-01321

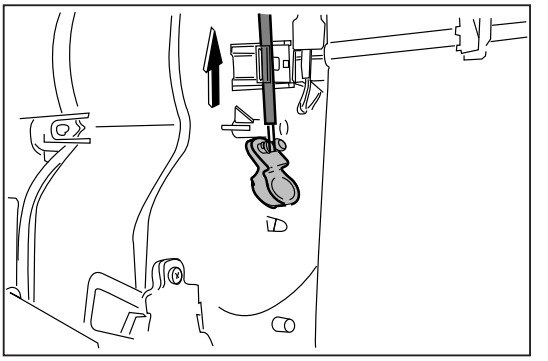
Adjustment of ventilation control

1. Ensure that the control levers move in a right-and-left direction without stiffness and binding over the full range of each lever.



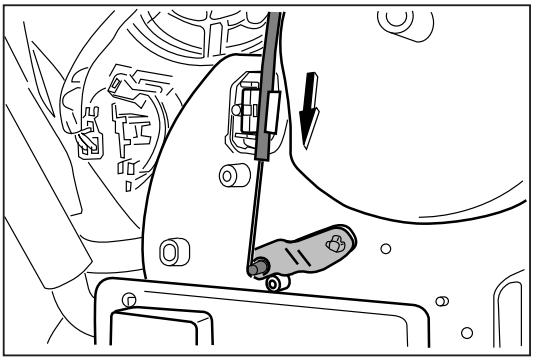
JBE00089-01331

2. Set the air outlet control lever to the VENT mode. Clamp the outer cable while pulling the outer cable toward VENT side.



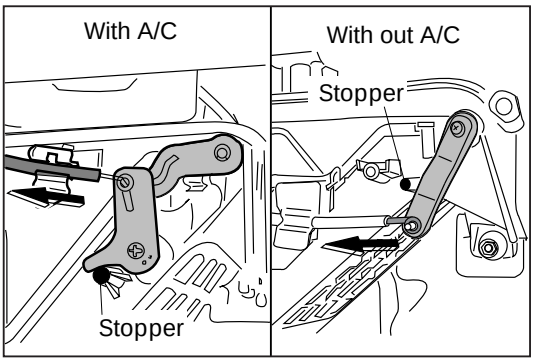
JBE00090-01332

3. Set the temperature control lever to the COOL mode. Clamp the outer cable while pushing the outer cable toward COOL side.



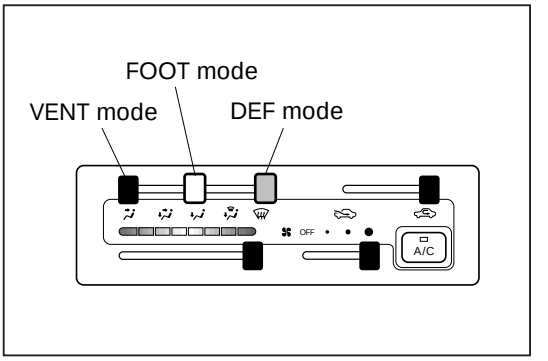
JBE00091-01333

4. Set the air inlet mode selector lever to the RECIRC mode. Clamp the outer cable while pulling the outer cable toward RECIRC side.



JBE00092-01334

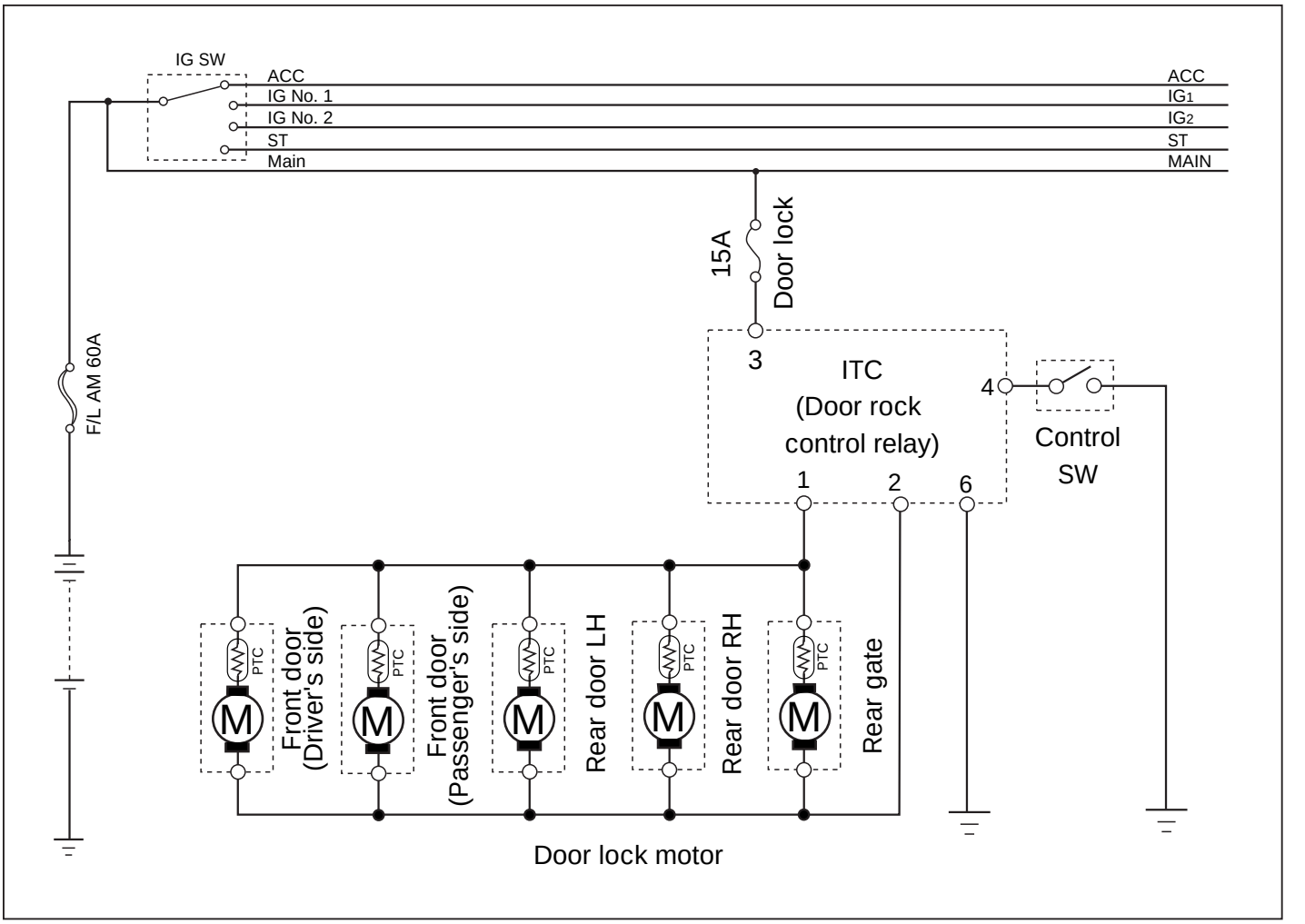
5. After completion of the adjustments in the steps 2 through 4, set the blower switch to the most highest position. Check the following items.
   (1) When the VENT mode is selected, ensure that no air leaks from the foot side outlet and defroster.
   (2) When the DEF mode is selected, ensure that no air leaks from the foot side outlet and register.
   (3) When the FOOT mode is selected, ensure that no air leaks from the register. if not, readjust the control lever.



JBE00093-01335

POWER DOOR LOCK

WIRING DIAGRAM

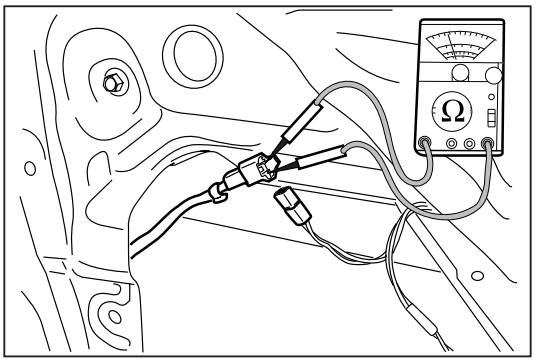


JBE00094-01401

DOOR LOCK CONTROL SWITCH

Unit inspection

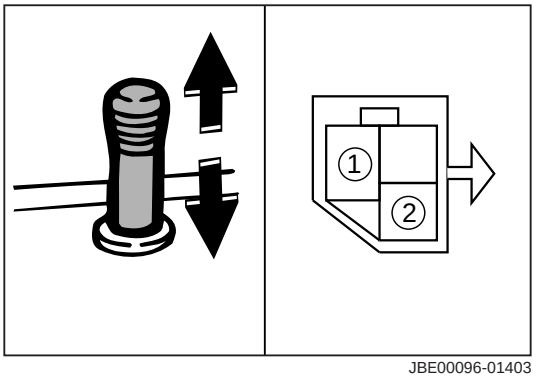
1. Remove the door trim-related parts.
2. Disconnect the connector.



JBE00095-01402

3. When the door lock switch is set to the LOCK and UNLOCK positions, respectively, ensure that continuity between the terminals of the door lock switch conforms to the requirements as indicated in the table below.

Terminal	①	②
LOCK		
UNLOCK	○	○



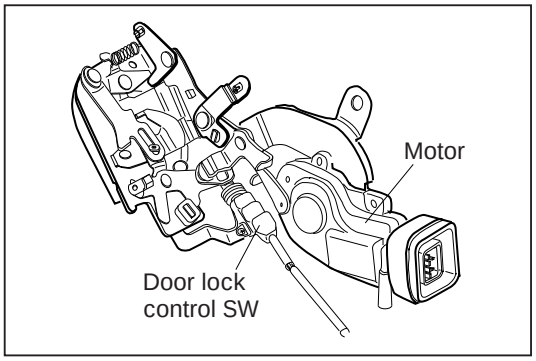
JBE00096-01403

DOOR LOCK MOTOR

Unit inspection

1. Detach the door locking knob from the control link.
2. Remove the door trim-related parts.
3. Remove the link-related parts.
4. Remove the attaching screws of the lock assembly.
5. Take out the lock assembly.
6. Apply a voltage of 12 V between the following two terminals. Ensure that the plunger operates in accordance with the table below.

Terminal / Operation direction	①	②
LOCK	⊕	⊖
UNLOCK	⊖	⊕



JBE00097-01404

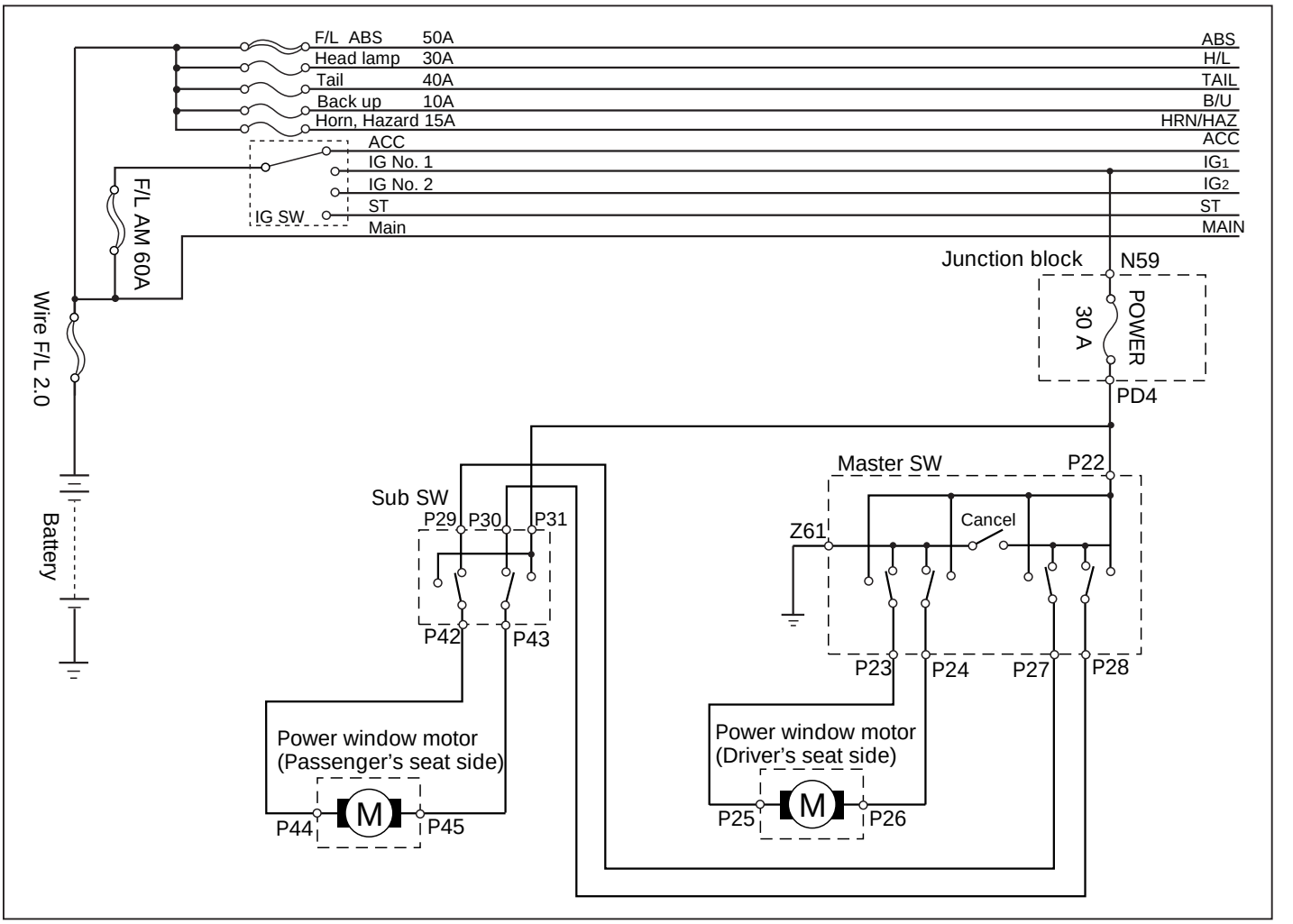
DOOR CONTROL RELAY

See page BE–45, ITC.

JBE00098-01405

POWER WINDOW

WIRING DIAGRAM



JBE00099-01501

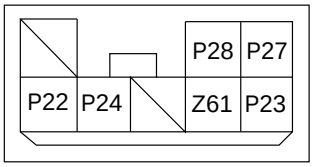
DRIVER'S SEAT SIDE SWITCH

Unit inspection (Left hand drive)

1. Remove the switch by means of suitable wooden peace.
2. When the switch is operated, ensure that continuity between the terminals conforms to the requirements as indicated in the table below.

	Driver's seat side			
	P22	P23	P24	Z61
UP manual	○	○	○	○
OFF		○		○
				○
DOWN	○		○	
		○		○
DOWN auto	○		○	
		○		○

Window lock switch		Passenger's (master)			
		P22	P27	P28	Z61
ON	UP	○	○	○	○
	OFF		○		○
					○
	DOWN	○		○	
			○		○
OFF	UP	○	○		
	OFF		○	○	
	DOWN	○		○	



Switch side

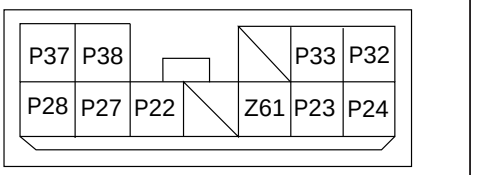
JBE00100-01502

Unit inspection (Right hand drive)

1. Remove the switch by means of suitable wooden peace.
2. When the switch is operated, ensure that continuity between the terminals conforms to the requirements as indicated in the table below.

	Driver's seat side			
	P22	P23	P24	Z60
UP manual	○	○	○	○
OFF		○		○
				○
DOWN	○		○	
		○		○
DOWN auto	○		○	
		○		○

Window lock switch		Passenger's (master)			
		P22	P27	P28	Z60
ON	UP	○	○	○	○
	OFF		○		○
				○	○
	DOWN	○		○	
			○		○
OFF	UP	○	○		
	OFF		○	○	
	DOWN	○		○	



Switch side

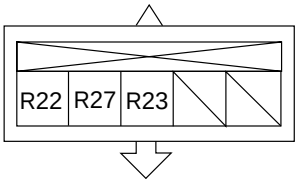
JBE00101-01504

FRONT PASSENGER'S SEAT SIDE SWITCH

Unit inspection

1. Remove the switch by means of suitable wooden peace.
2. When the switch is operated, ensure that continuity between the terminals conforms to the requirements as indicated in the table below.

	Power window switch				
	P42	P29	P30	P31	P43
UP	○			○	
			○		○
OFF	○	○	○		○
DOWN	○	○		○	○



Switch side

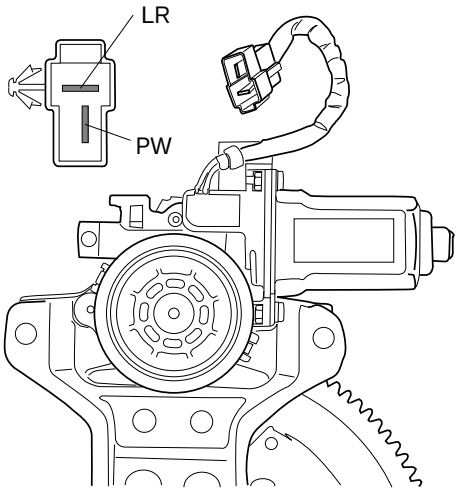
JBE00102-01506

POWER WINDOW MOTOR

Unit inspection

1. Remove the door trim assembly, service hole cover and remove the door window regulator.
1. Connect the positive (+) terminal of the battery to the connector PW of the power window motor; the negative (–) terminal to the connector LR. Ensure that the motor rotates clockwise, as viewed from the driving shaft side.
2. Connect the positive (+) terminal of the battery to the connector LR of the power window motor; the negative (–) terminal to the connector PW. Ensure that the motor rotates counterclockwise, as viewed from the driving shaft side.

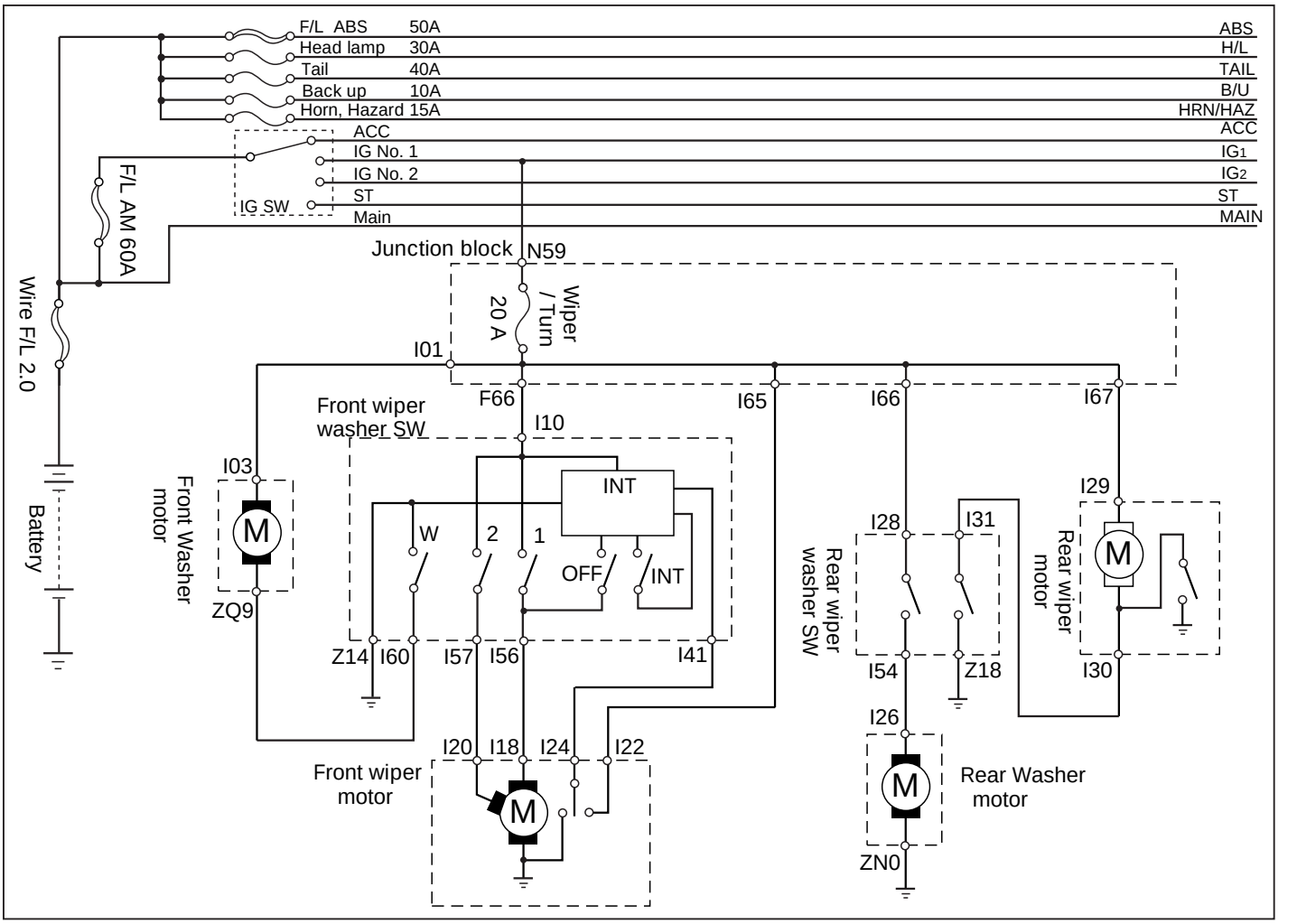
	PW	LR
Clockwise	⊕	⊖
Counterclockwise	⊖	⊕



JBE00103-01508

WIPER & WASHER

WIRING DIAGRAM

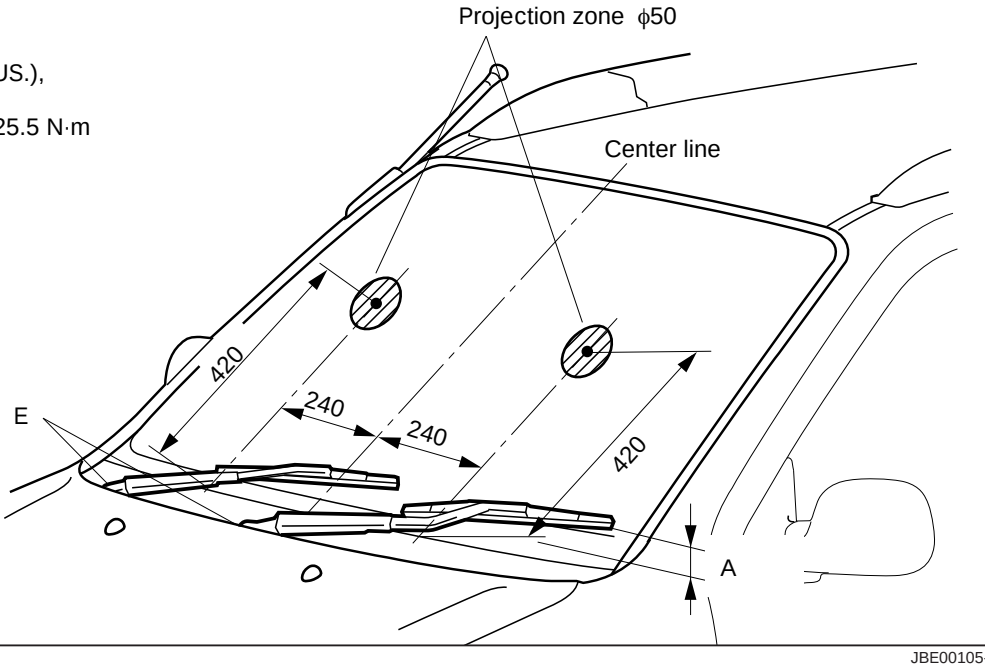


JBE00104-01601

Adjustment of wiper arm and washer nozzle

Inspect the wiping area and stationary position of the wiper blade.

A: 15 - 25 mm (Except for AUS.),
27- 37 mm (AUS. only)
E: Tightening torque; 14.7 - 25.5 N·m

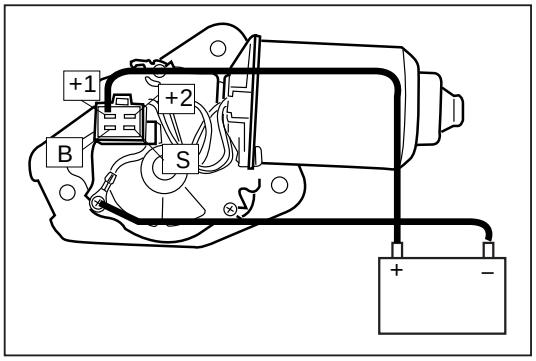


JBE00105-01602

WIPER MOTOR

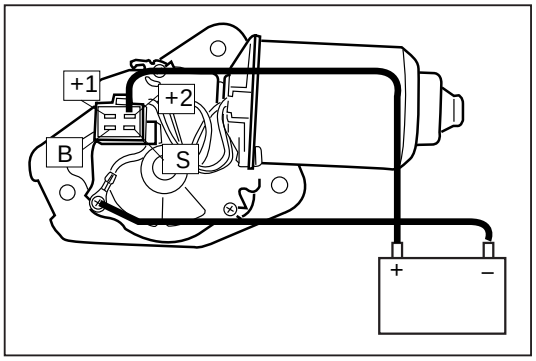
Unit inspection

1. Low speed operation check
   (1) Connect the terminal +1 to the positive ⊕ terminal of the battery; the body to the negative ⊖ terminal of the battery. Ensure that the wiper operates at the low speed 1



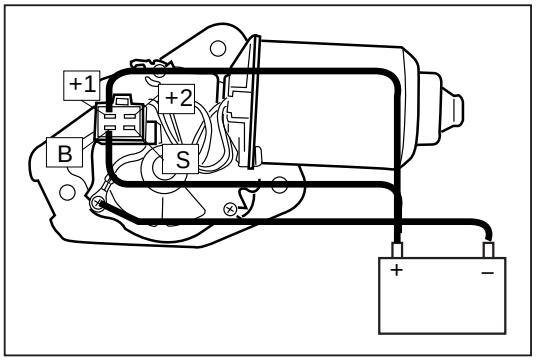
JBE00106-01604

2. High speed operation check
   (1) Connect the terminal +2 to the positive ⊕ terminal of the battery; the body to the negative ⊖ terminal of the battery. Ensure that the wiper operates at the high speed.



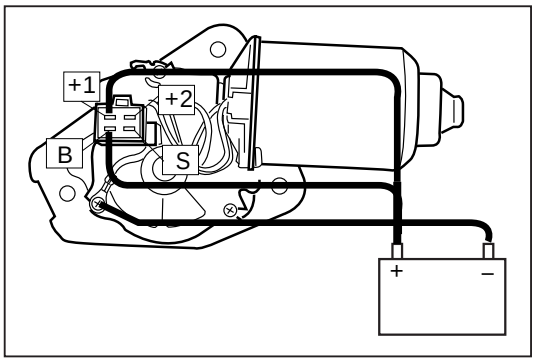
JBE00107-01605

3. OFF operation check
   With the wiper motor body connected to the negative ⊖ terminal of the battery, perform the following checks.
   (1) Connect the terminal B to the positive ⊕ terminal of the battery.
   (2) Operate the wiper at the low speed by connecting the terminal +1 to the positive ⊕ terminal of the battery.



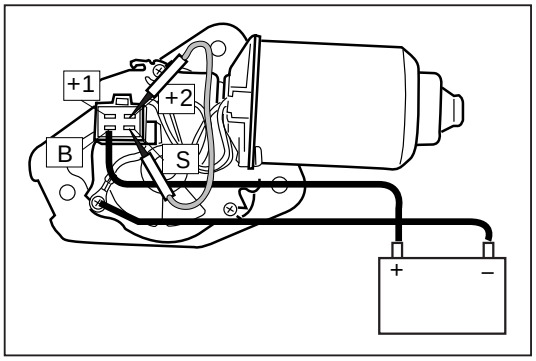
JBE00108-01606

   (3) Under the operating conditions in the step (2), disconnect the terminal +1 to as to interrupt the wiper motor operation.



JBE00109-01607

   (4) Connect the terminal +1 to the terminal S. Ensure that the wiper operates and stops at the automatic stopping position.

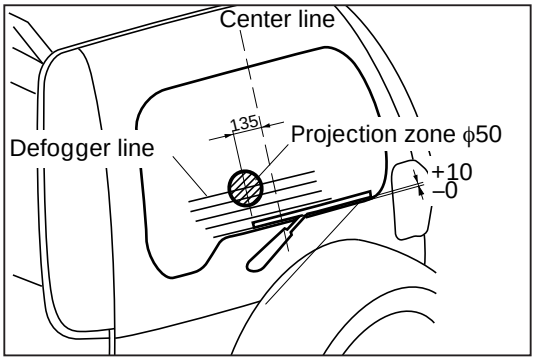


JBE00110-01608

Adjustment of rear wiper arm

Inspect the wiping area and stationary position of the wiper blade.

Tightening Torque: 4 - 7 N·m



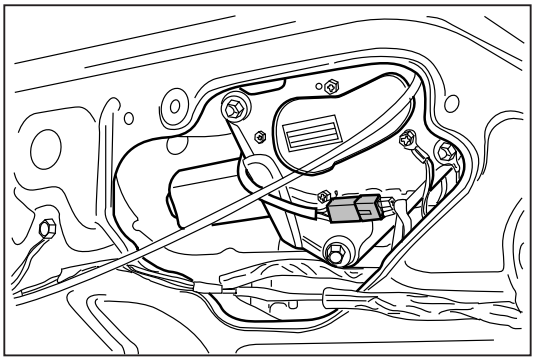
JBE00111-01609

REAR WIPER MOTOR

Unit inspection

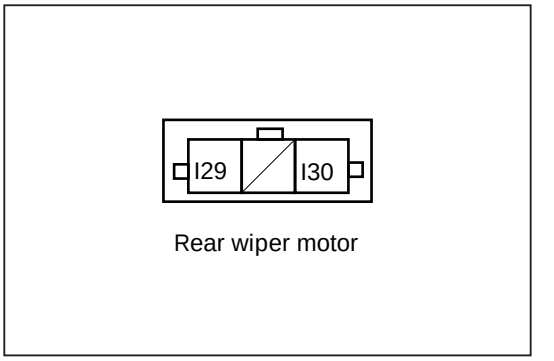
1. Remove the back door trim.
   NOTE:
   - See BO section of service manual.

2. Connect the battery negative terminal (–) to the wiper motor body. Also connect the battery negative terminal to the motor connector (–) and battery positive terminal (+) to the motor connector (+), as indicated in the right figure. Ensure that the wiper motor functions.



JBE00112-01610

3. Ensure that the wiper motor stops at the automatic stopping position when the battery negative (–) terminal is disconnected from the wiper motor negative (–) connector.



Rear wiper motor

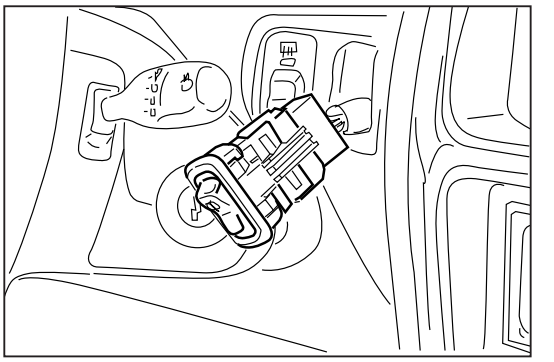
JBE00113-01611

REAR WIPER SWITCH

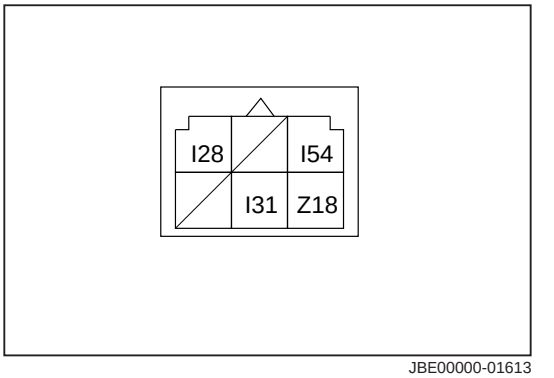
Unit inspection

1. Push the switch from back side while releasing the lock of the switch, remove the switch toward your side.
2. Disconnect the connector.
3. Ensure that continuity exists between the respective terminals, as indicated in the table below.

	Z18	I31	I28	I54
OFF				
Wiper ON	○	○		
Washer ON			○	○



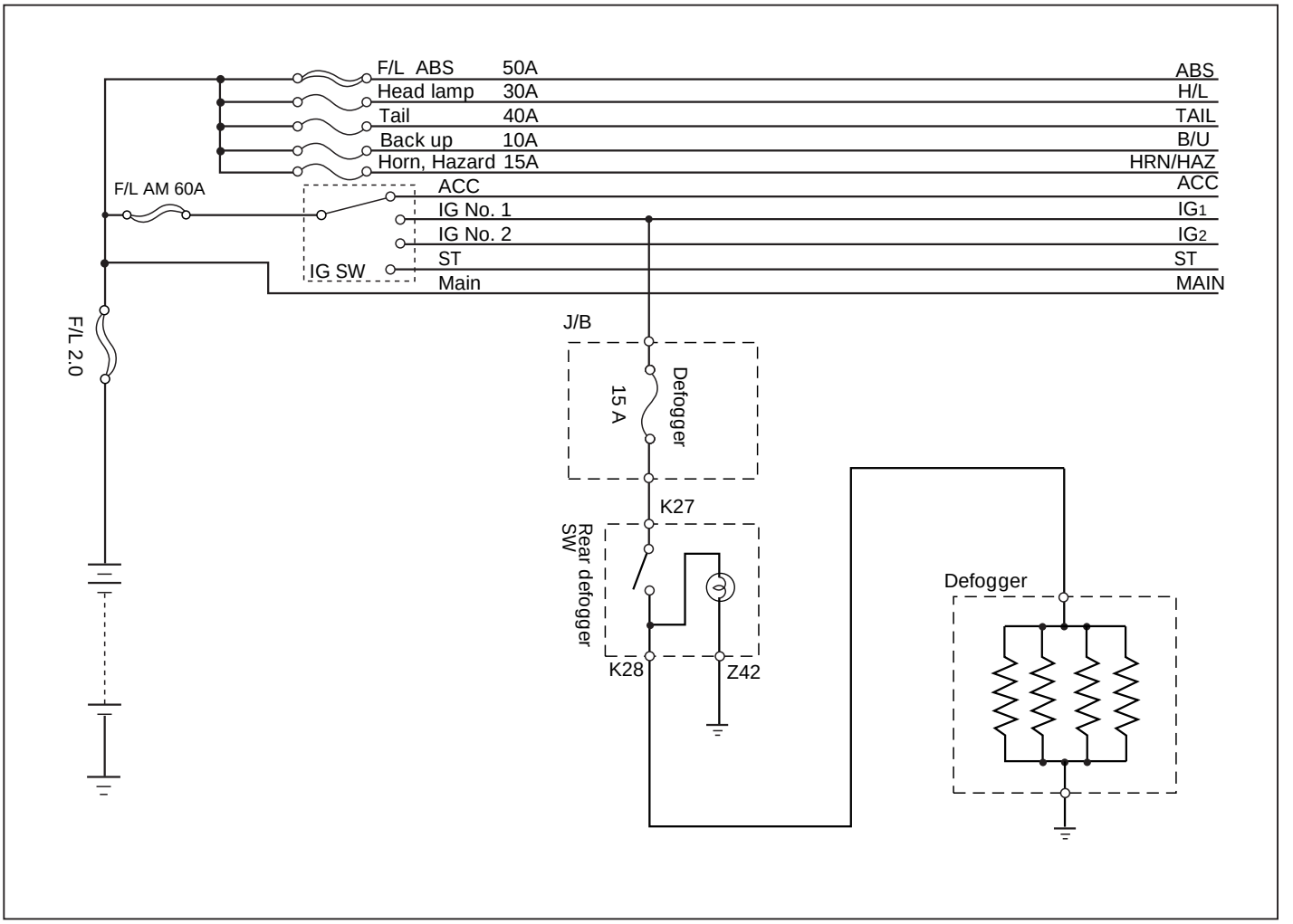
JBE00114-01612



JBE00000-01613

DEFOGGER

WIRING DIAGRAM



JBE00115-01701

DEFOGGER WIRE

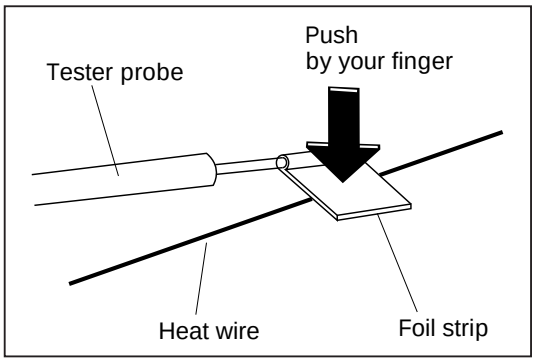
NOTE:

(1) When wiping the glass surface, use a soft, dry cloth. Move the cloth along the wire. Be careful not to damage the wire.

(2) Never use washing agent or glass cleaner which contains abrasive compound.

(3) Wrap the tip end of the tester probe with foil strip so that the tester probe causes no damage on the heat wire during the voltage measurement.

(4) Check the voltage by pushing the foil strip against the heat wire with your finger, as indicated in the figure.



JBE00116-01702

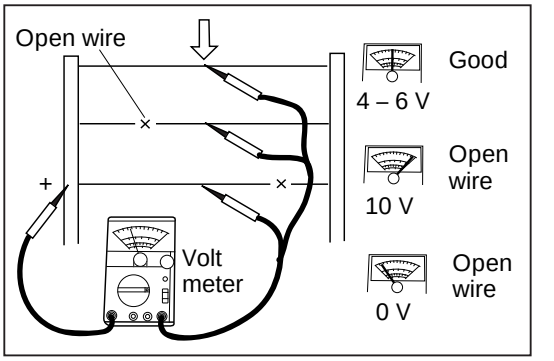
Open wire check

1. Turn on the ignition key switch.
2. Turn on the defogger switch so as to energize defogger wire.
3. Check the voltage at the center section of each heat wire.

Voltage	Judgment criteria
Approx. 5 V	Good (No open wire)
Approx. 10 V or 0 V	Open wire

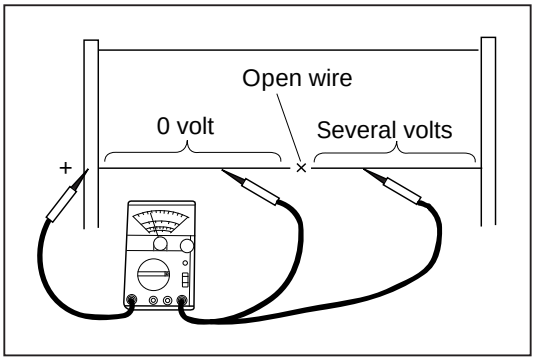
JBE00117-01703

REFERENCE:
- If the voltage is 10 V, it means that open wire exists between the center of the wire and the end of the positive ⊕ side. If the voltage is 0 V, it means that open wire exists between the center of the wire and the end of the earth side.



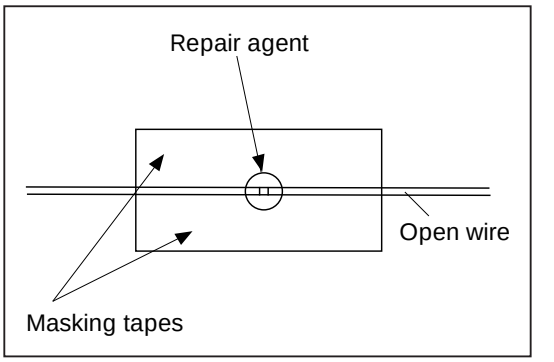
JBE00118-01704

Locating point of open wire
1. Connect the positive ⊕ terminal of the voltmeter to the positive ⊕ side of the defogger wire.
2. Slide the voltmeter's negative ⊖ terminal wrapped with foil strip on the defogger wire from its positive ⊕ side to its negative ⊖ side.
3. The voltmeter reading changes from 0 V to several volts at the point where open wire exists.



JBE00119-01705

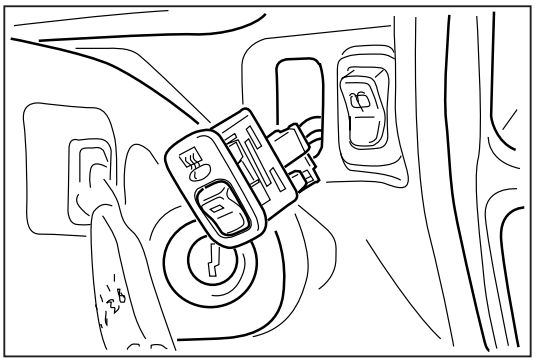
Repairing point of open wire
1. Clean the point of open wire with white gasoline.
2. Affix masking tapes to both upper and lower portions of the point to be repaired.
3. Stir repair agent (Du Pont Paste No. 4817) thoroughly. Apply a small amount of the repair agent to the repairing point, using a fine brush.
4. Two to three minutes later, peel off the masking tapes.
5. Do not energize the defogger wire within 24 hours after the repair.



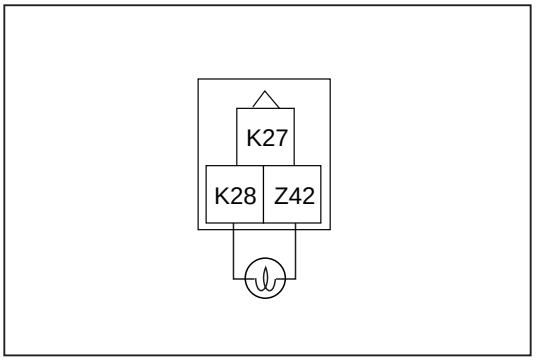
JBE00120-01706

DEFOGGER SWITCH

Unit inspection
1. Remove the instrument panel finish lower panel.
2. Remove the defogger switch by pushing it with your fingers at the back side of the instrument panel.
3. Disconnect the connector of the defogger switch.
4. Remove the defogger switch from the instrument panel.
   NOTE:
   - The indicator of the defogger in the combination meter will glow when the rear window defogger switch is turned on.


JBE00121-01707

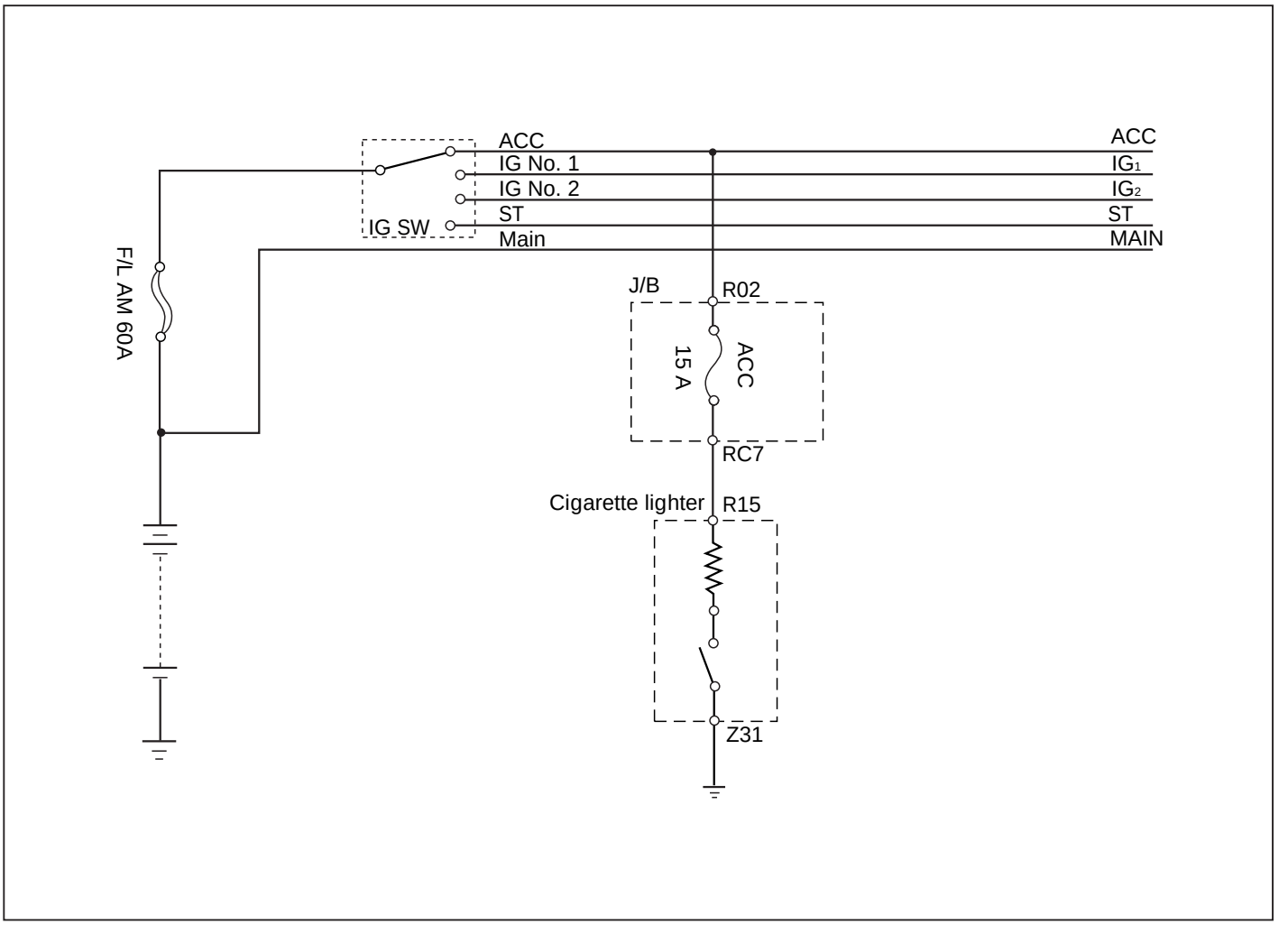
5. Ensure that continuity exists between the terminal Z27 and the terminal Z28 when the switch is turned on.
6. Check to see if the bulb is burnt out.



JBE00122-01708

CIGARETTE LIGHTER

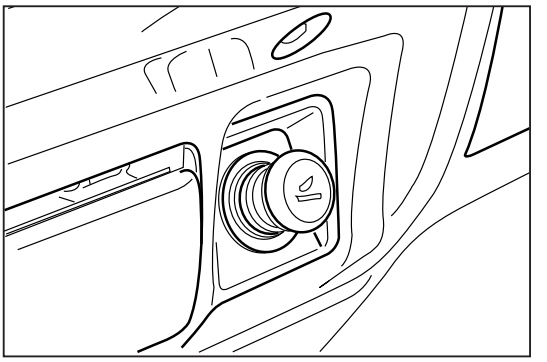
WIRING DIAGRAM



JBE00123-01801

In-vehicle inspection

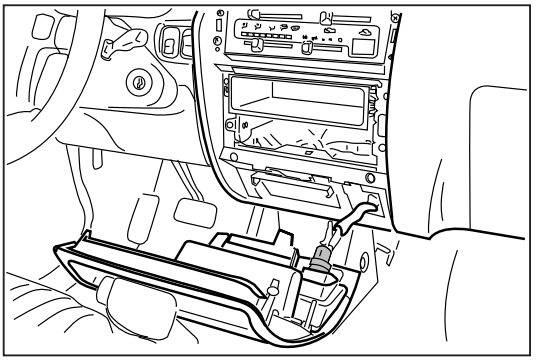
1. Push the cigarette lighter. Ensure that the heater section is heated and glows red.
2. Ensure that the heater section returns to the original position about 18 seconds.
   If not, replace the cigarette lighter.



JBE00124-01802

Removal

1. Remove the retaining screws of the instrument cluster finish center panel.
2. Pull out the instrument cluster finish center panel from the instrument panel.
3. Disconnect the connector from the cigarette lighter assembly.
   NOTE:
   - Refer to the BO section of the service manual.



JBE00125-01803

4. Turn about 2° and pull out 10 mm the cigarette lighter assembly. Then turn back about 2° (align the embossed at the connector side) and pull out the cigarette lighter assembly from the cigarette lighter bezel.
5. Remove the cigarette lighter.

JBE00126-01804

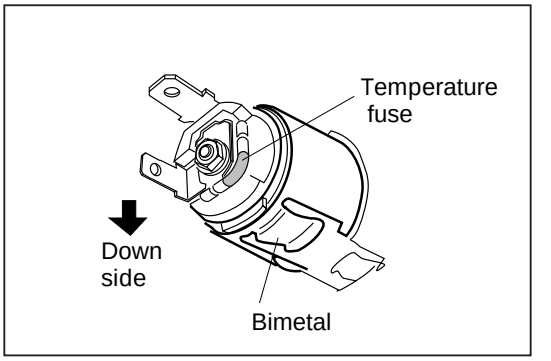
Installation

1. Align the embossed and insert the cigarette lighter assembly to the bezel.
2. Connect the connector of the cigarette lighter assembly.
3. Install the instrument cluster finish center panel with the retaining screws.

JBE00127-01805

WARNING:

- The cigarette lighter has such construction that the heater is energized when the lighter section is pushed-in, resulting in a red-heated heater. When the heater becomes red-heated, the bimetal that is retaining the lighter section will open because of the heat, thereby pushing out the heater unit. As a result, the energizing of the heater ceases.



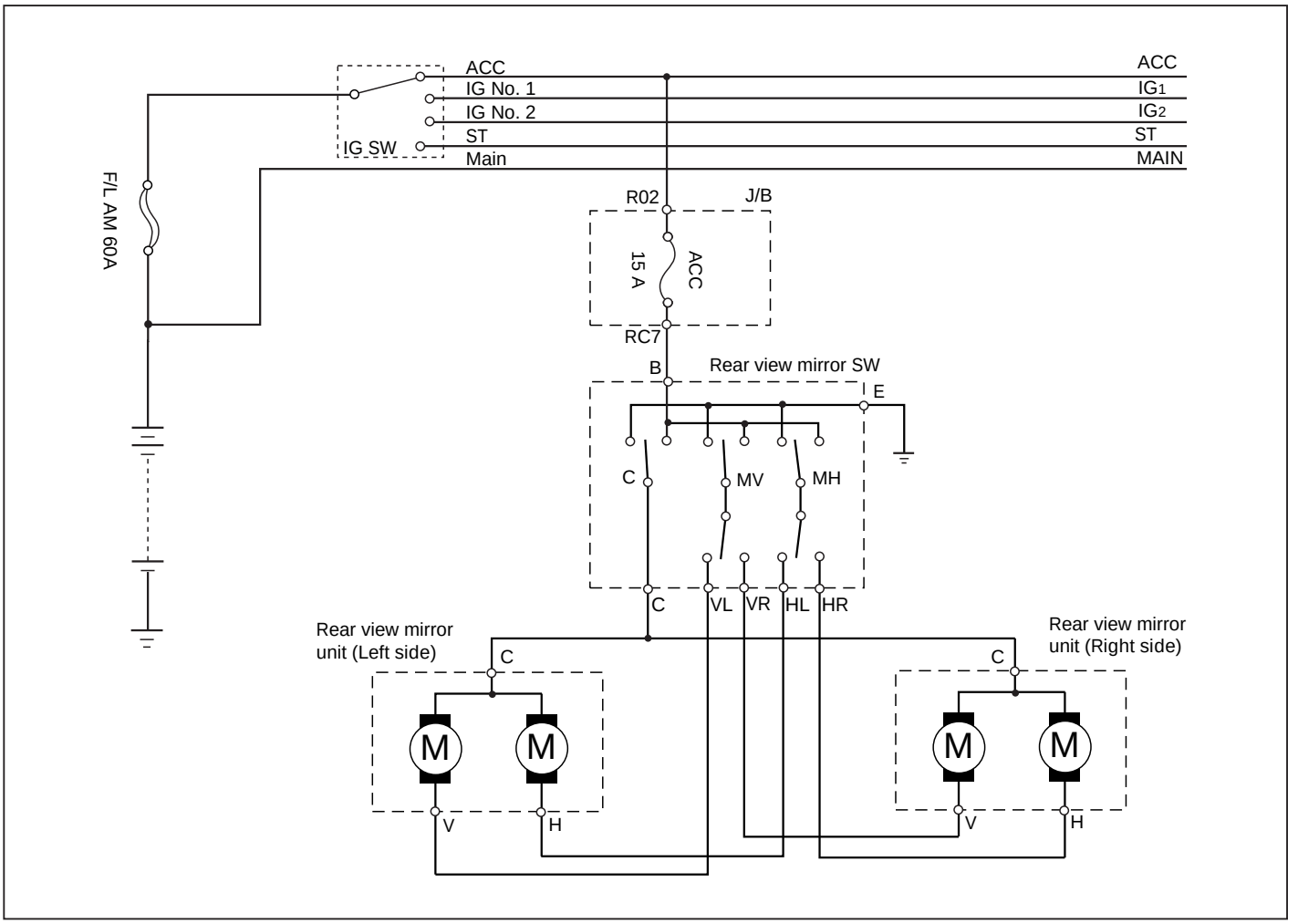
JBE00128-01807

- A temperature fuse is attached to the terminal of the electric fuse so as to prevent over-heating of the fuse in the event that the lighter can not pop out due to some reasons. make sure to install this temperature fuse at the underside of the terminal so that the circuit may be cut off when the temperature fuse is melt down.

JBE00129-01808

REAR VIEW MIRROR

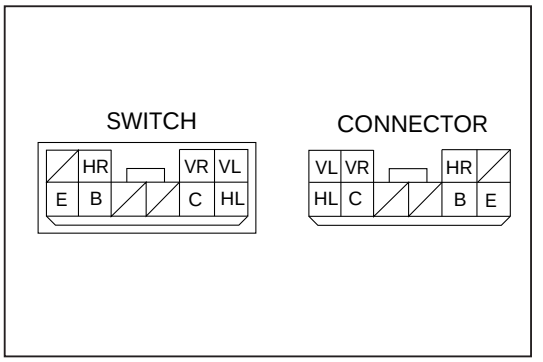
WIRING DIAGRAM



JBE00130-01901

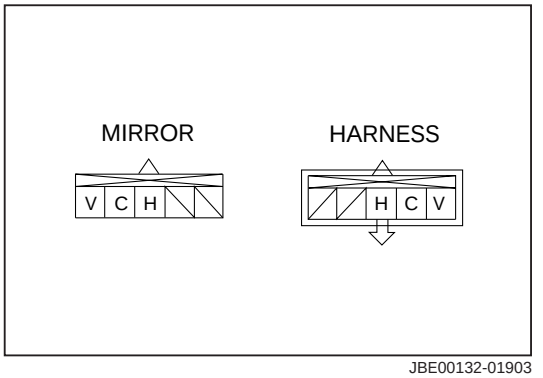
REAR VIEW MIRROR SWITCH

1. Pull out the switch assembly from the instrument panel. Disconnect the connector.
2. Ensure that the continuity exists between the respective terminals in accordance with the following continuity table.



JBE00131-01902

Mirror	Left					Right				
Switch position \ Terminal	B	E	VL	C	HL	B	E	VR	C	HR
UP	○		○			○		○		
		○		○			○		○	
DOWN	○			○			○	○		
		○	○			○			○	
LEFT	○				○	○				○
		○		○			○		○	
RIGHT		○			○		○			○
	○			○		○			○	

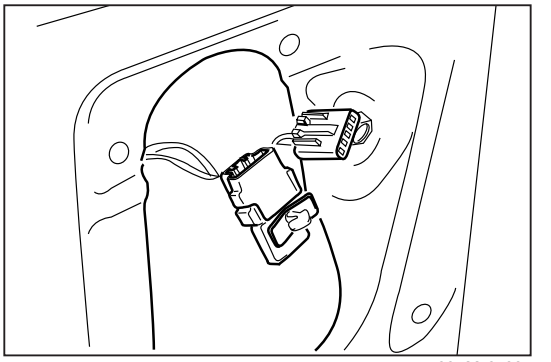


JBE00132-01903

REAR VIEW MIRROR UNIT

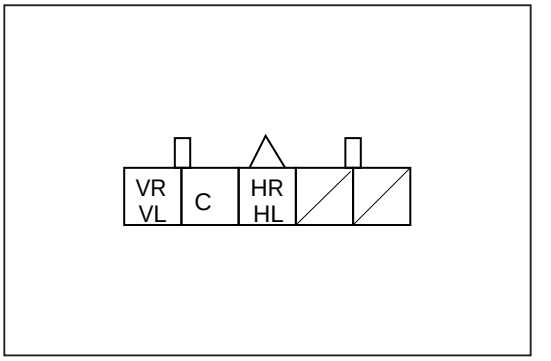
Unit inspection

1. Remove the front door trim assembly.
2. Disconnect the connector of the door mirror.
3. Apply a voltage of 12 V between the following two terminals.
4. Ensure that the mirror operates in accordance with the table below.



JBE00133-01904

Terminal		C	VR	HR	Operation direction
	Right door mirror	C	VR	HR	
	Left door mirror	C	VL	HL	
Connection		⊖	⊕		UP
		⊕	⊖		Down
		⊖		⊕	Left
		⊕		⊖	Right



JBE00134-01905

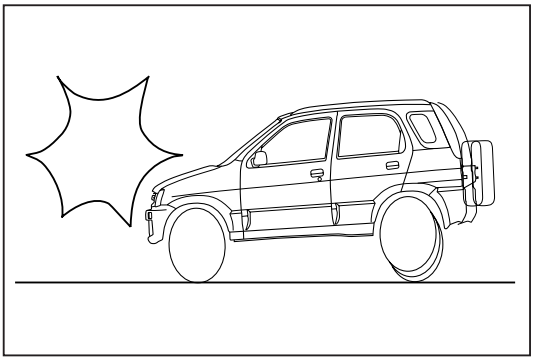
ITC SYSTEM

For enhanced safety of the motor vehicle, the ITC (Integrated Timer Controller) is controlled by an ECU which has the control system interlocked with the following functions.

1. Impact-detecting door unlocking system
2. All-door locking, interlocked with door lock button at driver's seat side.
3. Room lamp timer

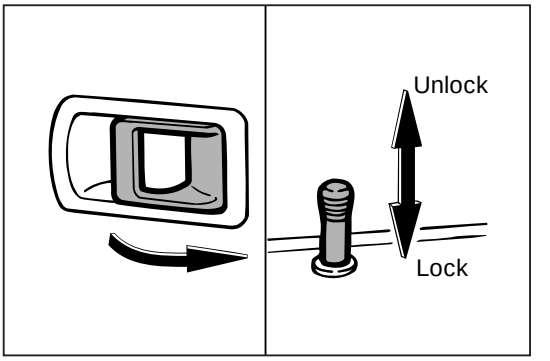
JBE00135-04000

4. Impact-detecting door unlocking system
   In the event that an impact beyond the specified value is applied to the vehicle. all of the doors are unlocked three seconds after the impact detection. Furthermore, when the vehicle speed drops to 0 km/h within 10 seconds after the impact detection, the hazard lamp are start to flash. When the switches of room lamp is set to position in which the lamp is interlocked with the door, the room lamp will go on simultaneously as the hazard lamp goes on. The impact is detected in all around horizontal directions.



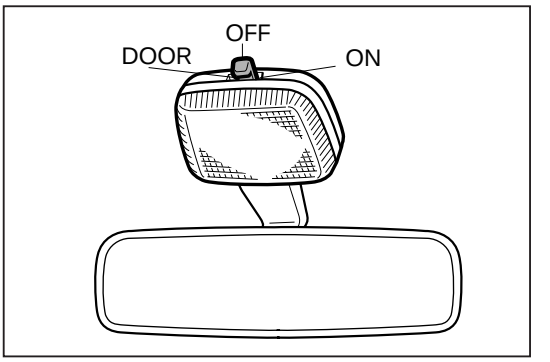
JBE00136-04001

5. All-door locking, interlocked with door lock button at driver's seat side
   All of the doors, including the back door, can be locked and unlocked, interlocked with the door lock button switch at the driver's seat side.



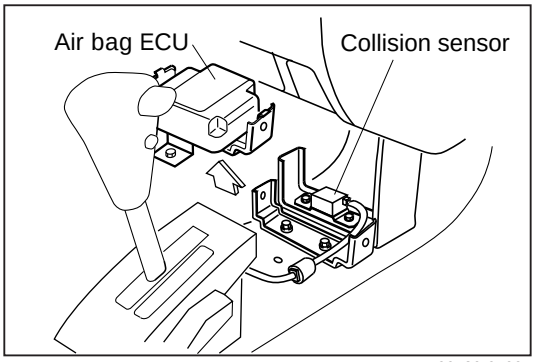
JBE00137-04002

6. Room lamp timer
   When any door is opened with the ignition switch turned off, the room lamp goes on. When all of the doors are closed, each lamp gradually dims, until it is finally extinguished. Namely, the lamp keeps approximately 75% of the original brightness for 3 seconds after the door is closed. For the next 2 seconds, the lamp is illuminated with an approximately 50% of brightness. The lamp goes out 5 seconds after the door is closed. When ignition switch is turned on while the lamp is dimming, the extinguished lag of the lamp is suspended.
   However, this function operates only when the switch of the room lamp is set to position in which the lamp is illuminated in interlocking with the door. Moreover, when the ignition switches set to the ON position, this function will not operate.
   In order to prevent the battery from being discharged, if the door remains opened for 10 minutes with the ignition switch turned off, the room lamp will go out. Afterwards, when the door is closed and again opened, the lamp goes on, and the same function operates.



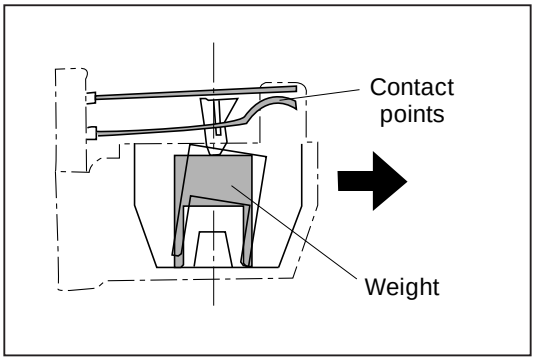
JBE00138-04003

Collision sensor
The collision sensor is mounted in front of the air bag ECU.



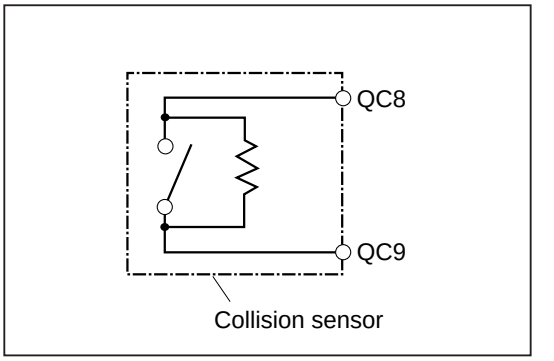
JBE00139-04005

Internal construction of collision sensor
The sensor consists of a weight for impact detection and electric contact points.



JBE00140-04006

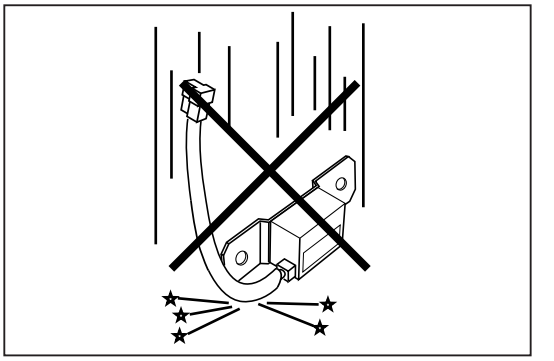
Moreover, the electric circuit is made up of a switch and a resistor which are connected in parallel. A voltage of five volts is always applied to both ends of the circuit from the ECU.
Therefore, in cases where the wire harness between the sensor and the ECU exhibits an open wire, an electric current flowing into the resistor will be shut off. As a result, the sensor judges that the circuit including the wire harness exhibits open wire, then setting off the buzzer.



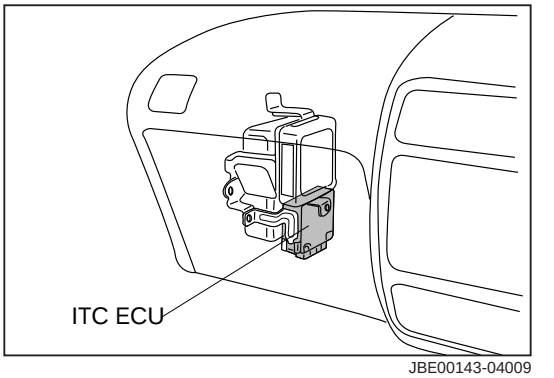
JBE00141-04007

In cases where the sensor circuit is shorted, no distinction can be made between the case where the circuit is shorted and the case where the switch is turned ON due to the function of the collision sensor. In the case of the short circuit, however, the ON condition of the switch lasts longer. Consequently, the ECU judges that it is an abnormality.

Utmost care must be exercised when a sensor is installed. If the sensor is dropped, the sensor cannot be used even if its external appearance exhibits no abnormality.

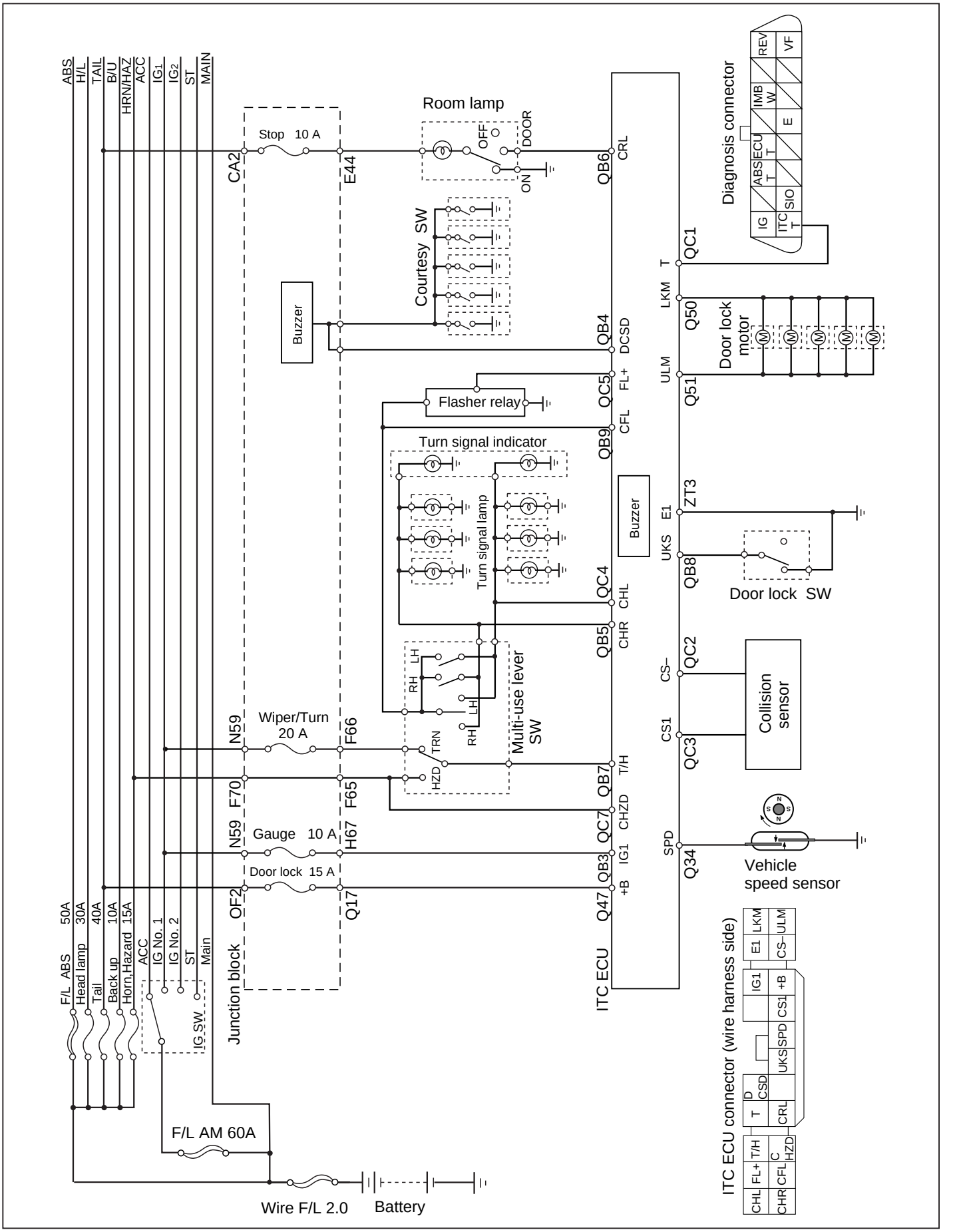

JBE00142-04008

The ITC ECU is mounted on the bracket of the cowl side inner panel at its passenger's seat side.



JBE00143-04009

CIRCUIT DIAGRAM



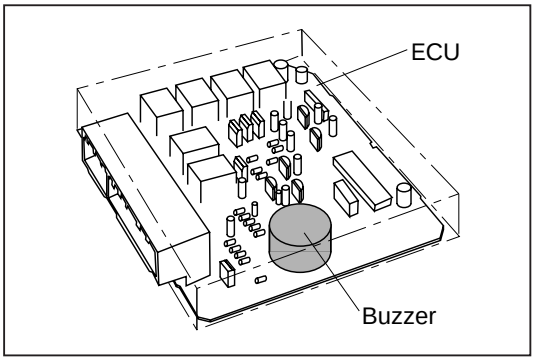
JBE00144-04010

TROUBLE-SHOOTING

When there is an open wire or a short in the collision sensor of the impact-detecting system, a warning buzzer provided in the ITC ECU is set off, emitting a continuous sound for five seconds.

NOTE:

- In the case of an open wire with the ignition switch turned on, if the open wire state continues to exist for 200 ms or more, the buzzer is set off. The impact-detecting function alone will not function, until the open wire state is eliminated.
- In the case of short circuit with the ignition switch turned on, if the short continues to exist for 2 seconds or more, the buzzer is set off. The impact-detecting function alone will not function, until the short circuit state is eliminated.

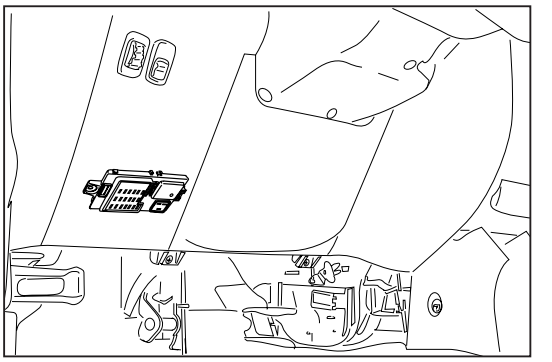


JBE00145-04011

Operation checking method by shorting terminal T (test terminal)

The operations of the following systems can be checked by connecting the test terminal provided at the check connector to the earth terminal with a jump wire.

- Vehicle speed sensor
- Room lamp system
- Hazard lamp system

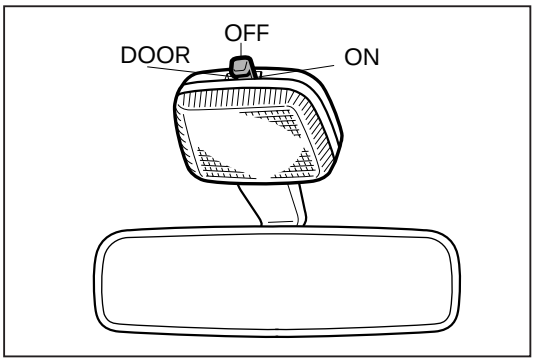


JBE00146-04013

(1) Set the switch for the room lamp to the door position in which the switch is interlocked with the door opening/closing.
(2) Warm up the engine. Drive the vehicle at a speed of 15 km or more.
(3) Stop the vehicle.

NOTE:

- Apply the parking brake. In the case of automatic transmission-equipped vehicles, move the shift lever to the P range.

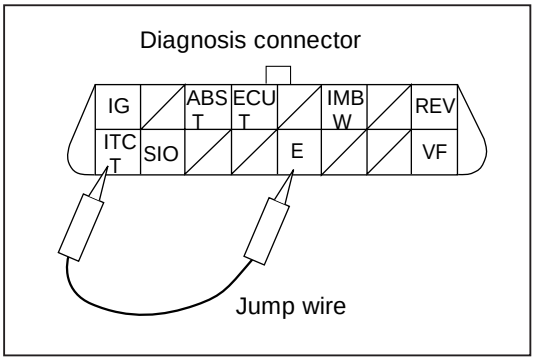


JBE00147-04014

(4) Connect the test terminal for ITC to the earth terminal with a jump wire, as shown in the figure.

NOTE:

- After the vehicle has stopped, do not turn off the ignition switch. Keep the engine idling.

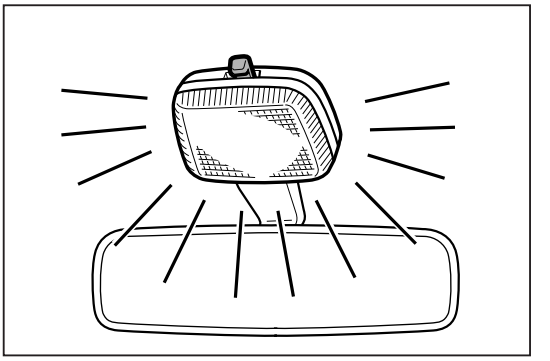


JBE00148-04015

(5) The hazard lamp flashes. At the same time, the room lamp is illuminated.

NOTE:

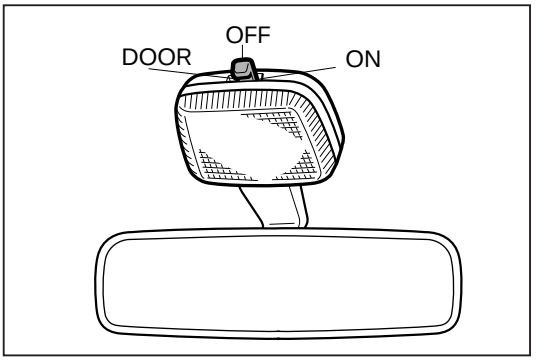
- If the lamp will not go on, check the wire harness and unit itself. If they are satisfactory, disconnect the jump wire. This completes the check.



JBE00149-04016

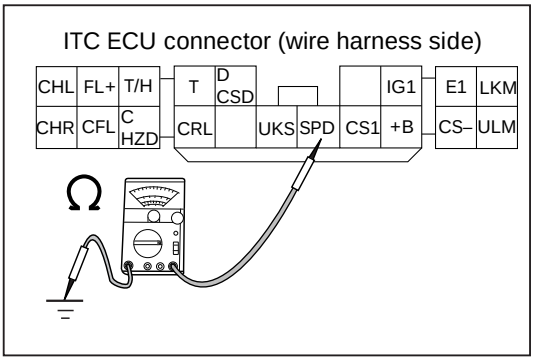
Malfunctions observed during operation check

1. When room lamp will not go on:
   (1) Check to see if the switch of the room lamp is set to the position in which the switch is interlocked with the door opening/closing.
   (2) Check to see if the lamp fuse has open wire.
   (3) Check to see if the lamp bulb is burnt out.
   (4) When the ignition switch is turned off, check to see if the room lamp goes on properly in accordance with switching.



JBE00150-04017

   (5) Turn off the ignition switch. Disconnect the connector for ITC ECU from the wire harness connector.
   (6) With a circuit tester set to the ohmmeter range, connect the circuit tester to between the terminal SPD of the connector at the vehicle wire harness side and the body earth.



JBE00151-04018

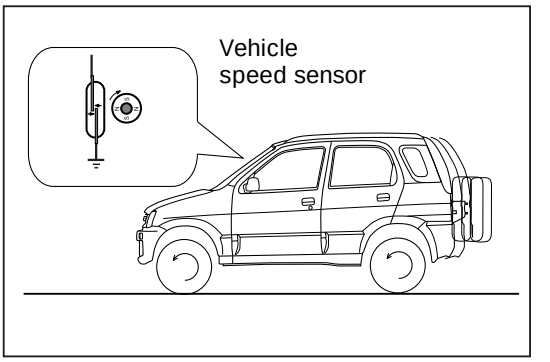
   (7) Move the vehicle one meter by pushing it. During this moving, check that the pointer of the ohmmeter moves.

WARNING:

- Be sure to turn off the ignition switch.

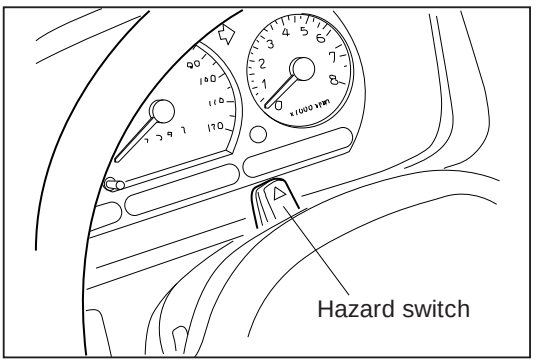
NOTE:

- If no abnormality is found in the checks (1) through (7), the harness or ITC ECU is regarded as faulty. Replace the harness or ITC ECU.



JBE00152-04019

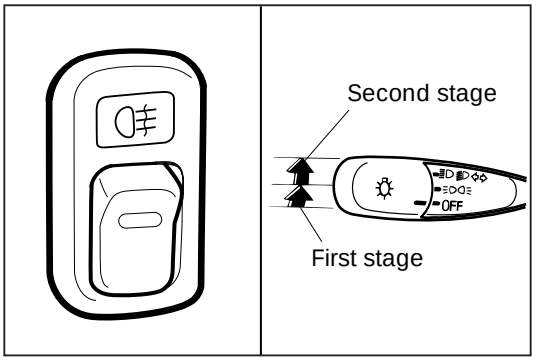
2. When hazard lamp will not flash:
   (1) Turn off the ignition switch and turn on the hazard switch. Check that the hazard lamp flashes properly.
   (2) If the hazard lamp will not flash, check the hazard lamp circuit and switch.
   (3) Check to see if there is open wire in the horn/hazard lamp fuse.
   (4) Check to see if the multi-use lever switch connector is fit properly.
   (5) Check to see if the flasher relay is functioning properly.



JBE00153-04020

REFERENCE:

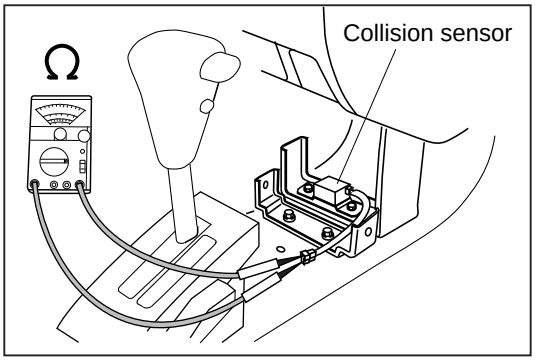
- When the buzzer provided in the junction block is set off when the door is opened even if the ignition switch has been turned off, there is the possibility that the following switches given below are turned on. Check these switches.
  (1) Rear fog lamp switch
  (2) Lighting switch



JBE00154-04021

Check to be performed when buzzer is set off with ignition switch turned on

(1) Turn off ignition switch.
(2) Disconnect the connector of the crash sensor sub-harness. Measure the resistance between the terminals of the crash sensor, using a circuit tester.
Specified Value: 2.2 kΩ



JBE00155-04022

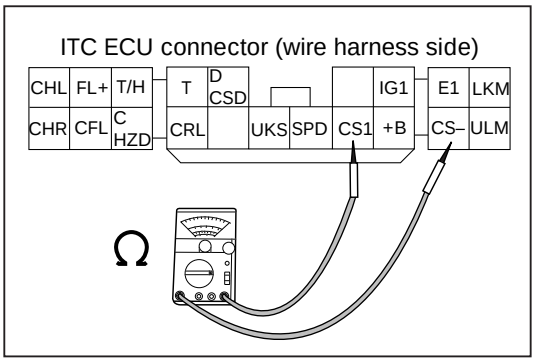
NOTE:

- If there is no open wire nor short, connect the connector of the crash sensor sub-harness and connector of the vehicle wire harness to their original positions.

(3) Disconnect the ITC ECU connector from the connector at the vehicle wire harness side.
(4) Measure the resistance across the terminals CS1 and CS– of the connector at the vehicle wire harness side, using a circuit tester.

NOTE:

- If there is no open wire nor short circuit, the ITC ECU is regarded as faulty. Replace the ITC ECU.



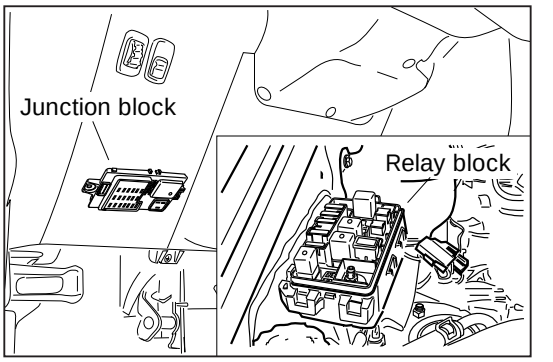
JBE00156-04023

Malfunction of power door lock

NOTE:

- When each door can not be locked in interlocking with the door lock button at driver's seat, proceed to the following checks.

(1) Check to see if the tail fuse (40 A) or door lock fuse (15 A) has open wire.
(2) Turn off the ignition switch. Disconnect the ITC ECU connector from the connector at the vehicle wire harness side.

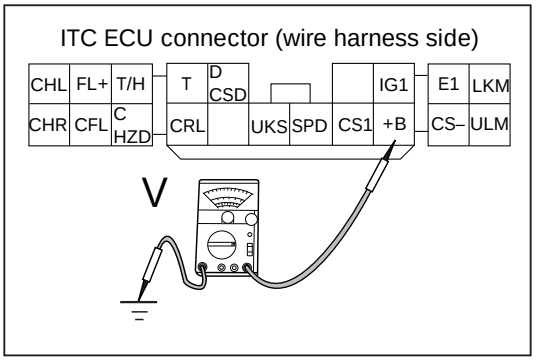


JBE00157-04024

(3) With a circuit tester set to the voltmeter range, connect the circuit tester to between the terminal +B of the connector at the vehicle wire harness side and the body earth, as shown in the figure. Check to see if the battery voltage is applied.

NOTE:

- The battery voltage is applied to this terminal at all times regardless of the ON/OFF state of the ignition switch.

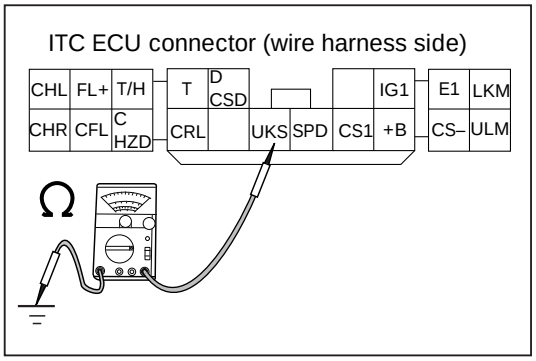


JBE00158-04025

(4) With a circuit tester set to the ohmmeter range, connect the circuit tester to between the terminal UKS of the connector at the vehicle wire harness side and the body earth, as shown in the figure. Check to see if continuity exists.

NOTE:

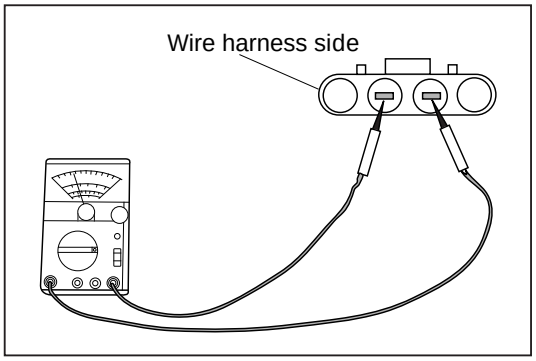
- This terminal has no continuity when the door lock button at driver's seat is locked. Conversely, this terminal has continuity when the door lock button at the driver's seat is not locked.
- If this check reveals abnormality, check the door lock control switch and wire harness.



JBE00159-04026

(5) Connect the ITC ECU connector with the connector at the vehicle wire harness side. (Connect the connectors that were disconnected at Step (2) into the original positions.)

(6) Disconnect the door lock motor connector at the door side whose locking is inoperative from the connector at the vehicle wire harness side. Connect a circuit tester in its voltmeter mode, as shown in the figure.



JBE00160-04027

(7) Turn on the ignition switch and lock or unlock the door lock button at the driver's seat. Check to see if the voltmeter registers the battery voltage. If there is abnormality, check the wire harness.

NOTE:

- The current during the locking state flows in the reverse direction, as opposed to the current during the unlocking state.

JBE00161-04028

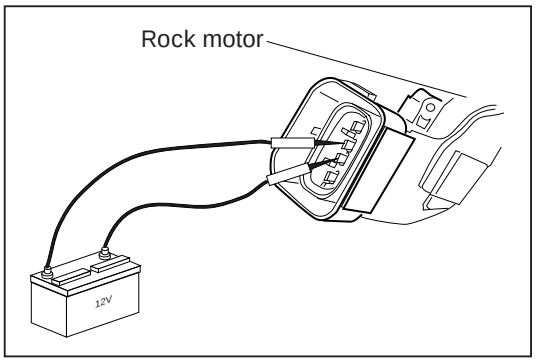
(8) If there is no abnormality in the check at Step (7), apply the battery voltage directly to the door lock motor terminal to see if the door lock functions.

CAUTION:

- Never let the current flow for ten seconds or more continuously.

NOTE:

- If the lock motor has no abnormality, the ITC ECU is regarded as faulty. Replace the ITC ECU.



JBE00162-04029

SRS AIR BAG SYSTEM

IMPORTANT SAFETY NOTICE

All information used in this service manual was in effect at the time when the manual was approved for printing. However, the specifications and procedures may be revised due to continuing improvements in the design without advance notice and without incurring any obligation to us.
The procedures contained in this manual describe in a general way the techniques which the manufacturer has recommended. Thus, they will contribute to ensuring the reliability of the products. The contents of the servicing operations come in a wide variety of ways. This manual does not cover all details of techniques, procedures, parts, tools and handling instructions which are necessary for these operations, for such coverage is impossible. Hence, any one who obtains this manual is expected first to make his responsible selection as to techniques, tools and parts which are necessary for servicing the vehicle concerned properly. Furthermore, he must assume responsibility for his actions in connection with his own safety. Therefore, one should not perform any service if he is not capable of making responsible selection and/or if he can not understand the contents herein described, for this manual is prepared for experienced service personnel.

JBE000163-05000

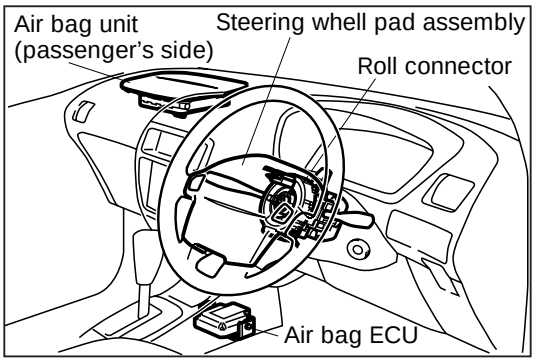
TECHNICIAN SAFETY INFORMATION

WARNING:

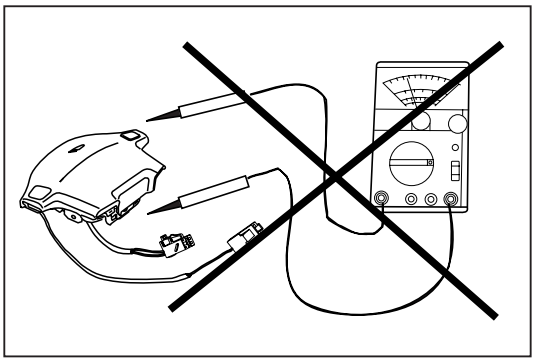
- When removing and installing the air bag assembly, the technician should stand whenever possible on the side of the air bag assembly.
- During installation or replacement, do not bump the area near the ECU unit of the SRS air bag, using an impact wrench, a hammer or the like.
- Whenever the ignition switch is on, or has been turned off for only less than three minutes, be carefully not to bump the ECU unit of the SRS air bag, for the air bag could accidentally deploy and cause damage or injuries.
- Never measure the resistance of the inflator squib easily. This may cause the air bag to deploy, thus causing serious injuries to the operators and other people in the surrounding.

CAUTION:

- Before scrapping any air bag assembly or the vehicle which contains the air bag, the air bag assembly must be deployed.
- Do not disassemble the SRS air bag unit. It has no serviceable parts.



JBE00164-05001

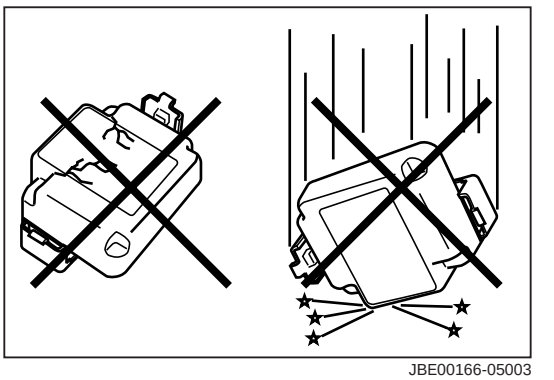


JBE00165-05002

VEHICLE PREPARATION FOR SERVICING

CAUTION:

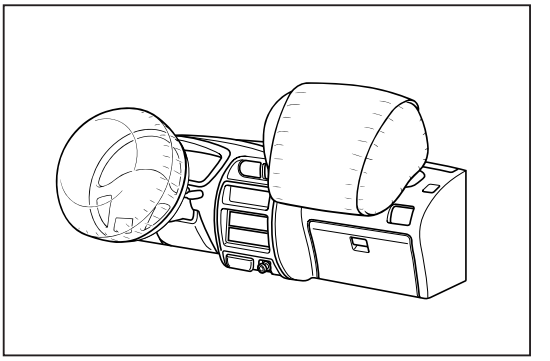
- Do not install a used air bag assembly from another car. When repairing, use only a new air bag assembly.
- Do not replace the original steering wheel with a steering wheel of any other design, since it will make impossible proper installation of the air bag.
- Do not use any air bag assembly or air bag ECU unit which was subjected to water damage or shows signs of being dropped or improperly handled, such as dents, cracks and deformation.



JBE00166-05003

SYSTEM DESCRIPTION

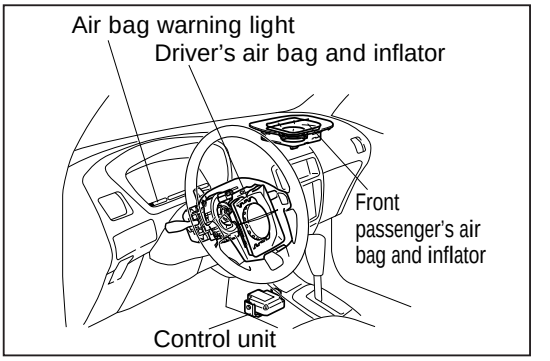
This air bag system is a supplemental device to protect passengers in the event of a frontal collision. The driver's seat is provided with an air bag and a seat belt. The front passenger seat is provided with a seat belt and optional air bag, whereas the rear passenger seat is provided with seat belts only.
If the vehicle undergoes a frontal collision and the system detects it and the impact exceeds a specified value, the air bags deploy to reduce the impact to the passengers.



JBE00167-05004

This air bag system is composed of the following main parts.

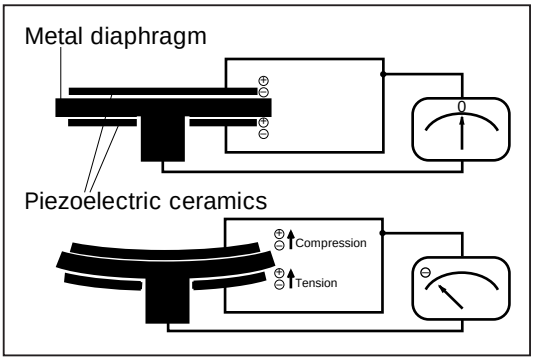
- Air bag ECU (Computer)
- G sensor (built in the air bag ECU)
- Safing sensor (built in the air bag ECU)
- Air bag unit (consists of Inflator and bag)
- Steering roll connector
- Warning lamp



JBE00168-05005

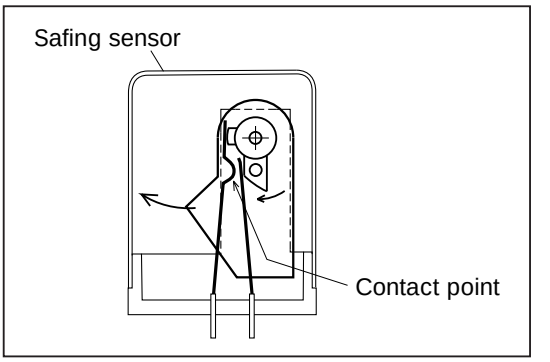
Air bag ECU & sensor

The air bag ECU is located under the console panel.
G sensor and a safing sensor are provided as sensors which sense the deceleration in the event of collision. The crash sensor is incorporated in the logic circuit of the air bag ECU. The G sensor calculates the deceleration, based on the magnitude of a potential difference, when the impact waves vibrates the sensor during the collision.



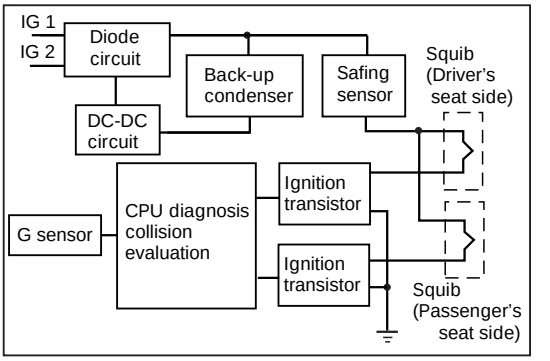
JBE0169-05006

The safing sensor is placed on the circuit board inside the ECU case. If a deceleration exceeding the specified value is applied to the sensor by the impact, the inertia force of the pendulum overcomes the reaction force of the spring. As a result, the pendulum moves to the switch side, thereby closing the contact points of the switch.



JBE00170-05007

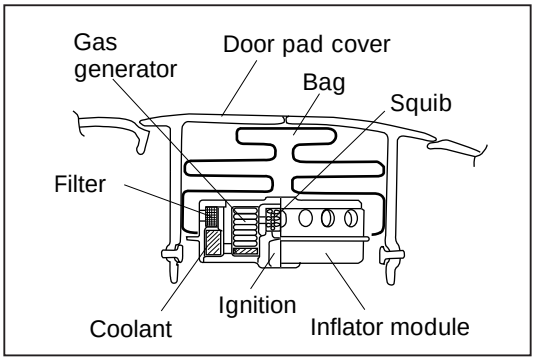
As regards the system operation, the ECU calculates the deceleration detected by the G sensor and compares it with the specified value. If the ECU has judged that a collision is taking place, it outputs an ignition signal. If the safing sensor is turned on at this time, an electric current which is necessary for the ignition is supplied to the air bag inflator.
The air bag ECU has a backup power supply consists of a backup condenser and voltage set-up circuit.



JBE00171-05008

Air bag unit

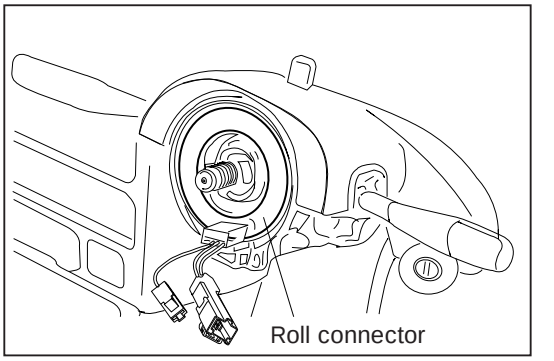
The air bag for the driver's seat is accommodated in the steering wheel pad assembly.
The air bag for the front passenger seat is accommodated in the instrument panel. Each air bag is assembled integral with the inflator module.
The inflator module consists of a squib, gas generator and so forth.



JBE00172-05009

Steering roll connector

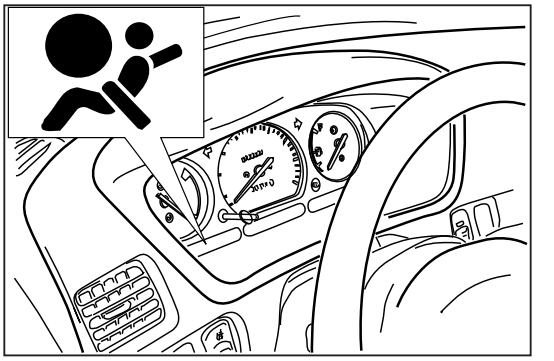
The steering roll connector is installed to the multi-use lever switch section. It is so designed that there may be no faults, such as poor contacts, compared with a slip ring method. This is because the wiring is kept connected even though the steering wheel is turned.



JBE00173-05010

Warning lamp

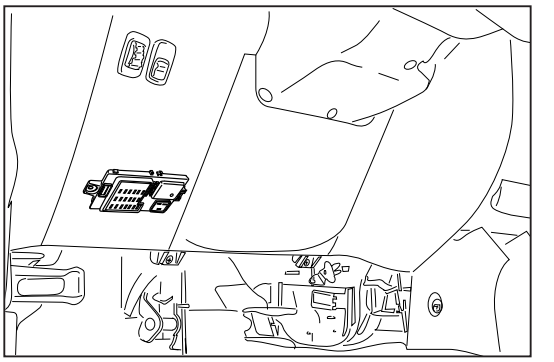
The warning lamp warns the driver of abnormality of the system.
This lamp, which is located inside the combination meter, tells the driver of abnormality by going on the lamp.
When the engine starts, this lamp is made to go on for six seconds so that the lamp can be checked for open wire of the lamp filament. If the lamp keeps going on for more than six seconds, it is considered abnormal.
In the event of abnormality, the diagnosis code can be read, using the air bag ECU inspection terminal of the check connector under the steering column. This malfunction diagnosis circuit makes it possible to find out malfunctioning sections quickly.



JBE00174-05011

Air bag fuse

The air bag fuse is located inside the fuse block.
The fuse provides power supply for the air bag ECU via the ignition switch. Furthermore, the ECU has a dual construction that its power supply can be furnished from the engine fuse side, too, in the event of failure of the air bag fuse.



JBE00175-05012

Wire harness and connector of air bag system

All wire harnesses and connectors related to the air bag system are colored yellow uniformly. The following sections have connectors with special functions.

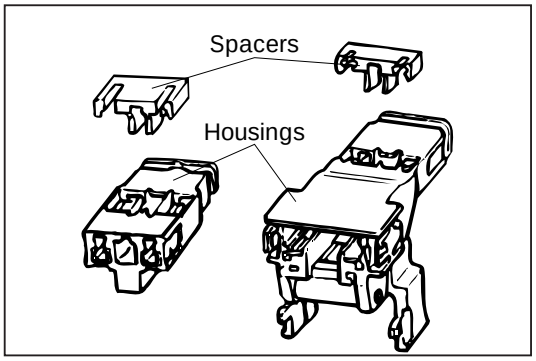
1. Terminal double locking mechanism
2. Terminal short mechanism
3. Connector double lock mechanism
4. Incomplete fitting detecting mechanism

JBE00176-05013

Terminal double locking mechanism

This mechanism is provided with all connectors.

The connector is of a two-piece construction consisting of a housing and a spacer. The terminal holding is double-locked by the lance (primary one) and the spacer (secondary one).

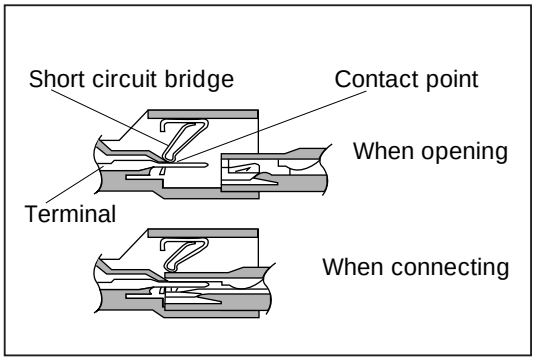


JBE00177-05014

Terminal short mechanism

This mechanism is provided at the connector between the computer and the inflator (squib).

A short spring plate is provided inside the connector. When the connector is disconnected, the terminal at the power supply side of the squib and the terminal at the earth side are shorted automatically, thereby preventing generation of a potential difference between both terminals.

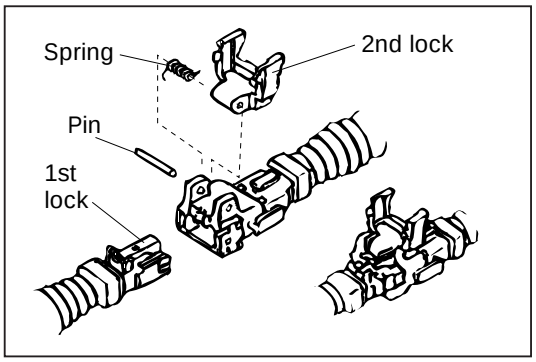


JBE00178-05015

Connector double locking mechanism

This mechanism is provided at the steering roll connector.

For improved reliability of connection, connectors (male and female connectors) are double locked with each other. It is so constructed that, when the primary lock is not made, the secondary lock can not be made because a protrusion hinders the locking.

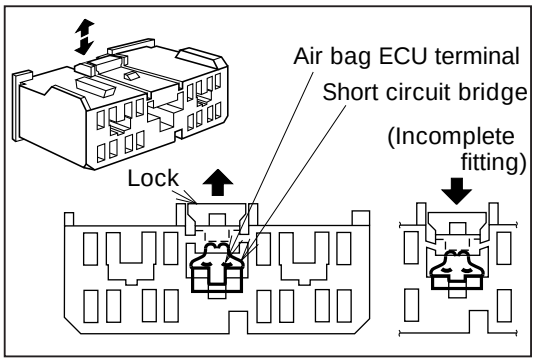


JBE00179-05016

Incomplete fitting detecting mechanism

This mechanism is provided at the connector for the air bag ECU. This mechanism detects electrically whether the connector is connected completely or not. When the connector is fit completely, the detecting pins at the IN and OUT sides are connected through a resistor, allowing an extremely small amount of current to flow to the computer. In this way, the fitting condition is monitored.

When the connector is connected, the detecting pins are inserted along a tilted section provided at the inner wall of the connector. When the connector is inserted completely, the detecting pins are disengaged from the tilted section, and contact the terminal.

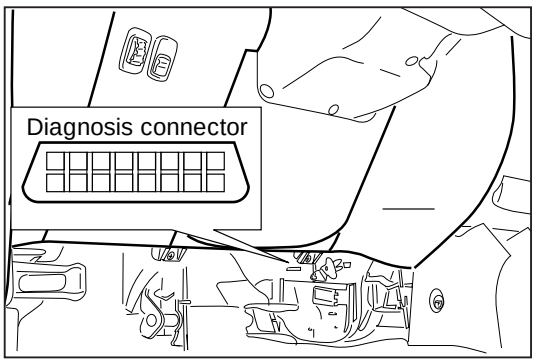


JBE00180-05017

Malfunction diagnosis function

Several items are available as the diagnosis items, including the normal code.

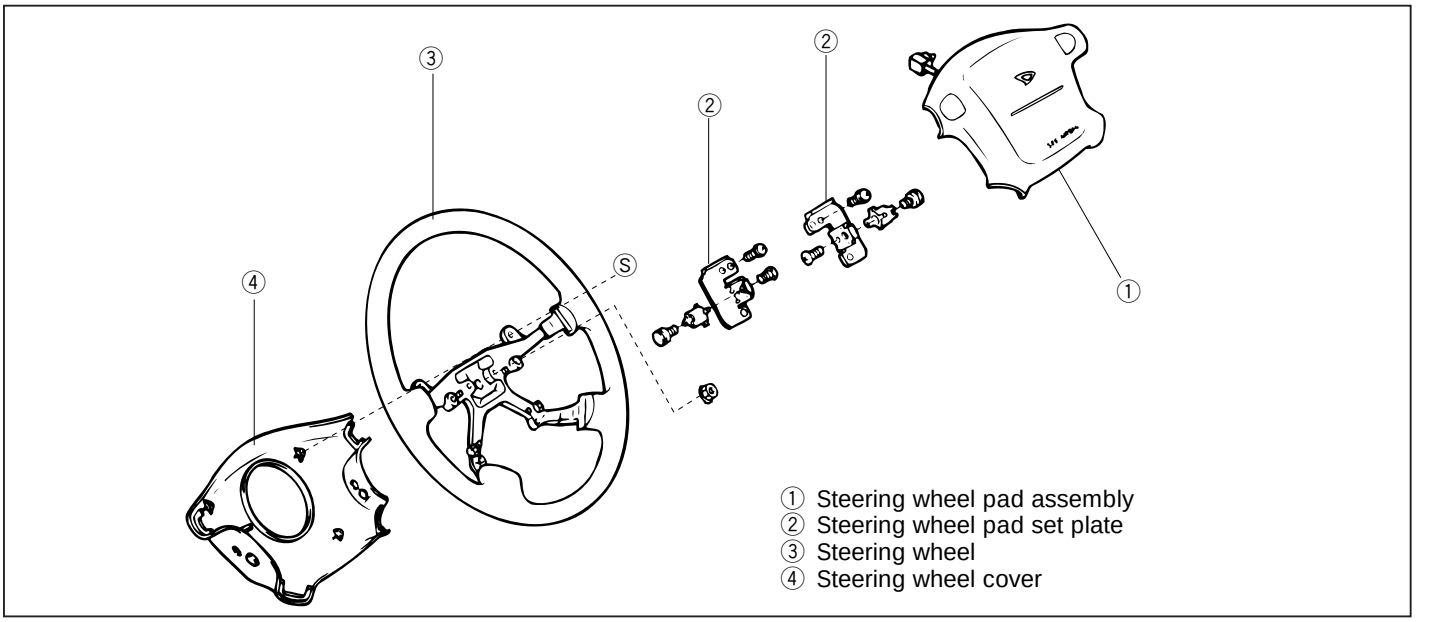
When the system is encountered with an abnormality, the computer memorizes the relevant abnormality item. All malfunction codes are retained until the malfunction codes are erased by the malfunction record erasure procedure or through transmission with the diagnosis tester (DS21).



JBE00181-05018

STEERING WHEEL PAD (AIR BAG UNIT FOR THE DRIVER) & STEERING ROLL CONNECTOR

COMPONENTS



JBE00182-05019

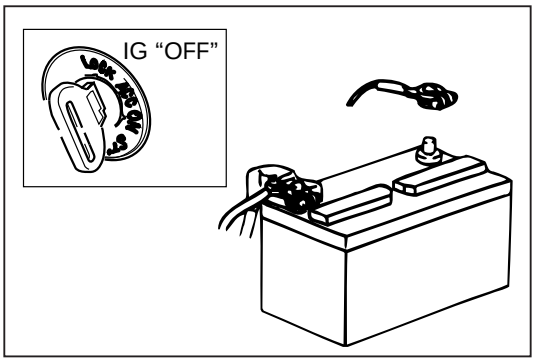
REMOVAL

1. Turn off the ignition switch and detach the negative (–) terminal of the battery cable from the battery terminal.
2. Set the steering wheel to a straight-ahead position.
   Remove the attaching bolts (TORX®) at the right and left sides of the steering wheel cover side.

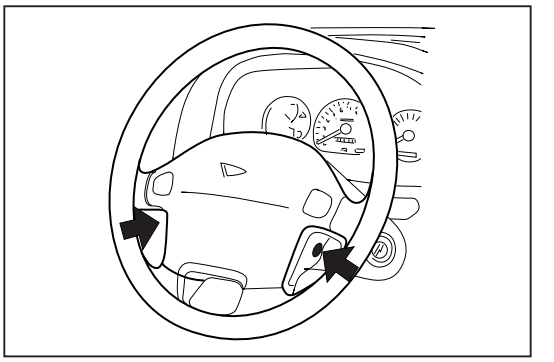
   WARNING:
   - Be sure to start the operation 60 seconds after the power supply is cut off. Failure to observe this warning may cause unexpected deployment of the air bag owing to impacts, etc. during the removal.
   - Never bring your face, arms and body to the front of the steering wheel during the removal.
   - If the pad assembly is dropped or damaged during the removal or the storage, be sure to dispose of the pad assembly according to the disposal procedure. Be sure to mount a new pad assembly to the vehicle.

   CAUTION:
   - It should be noted that, when the negative (–) terminal of the battery is detached, the memory of the ECU control of the other system will be erased at the same time.

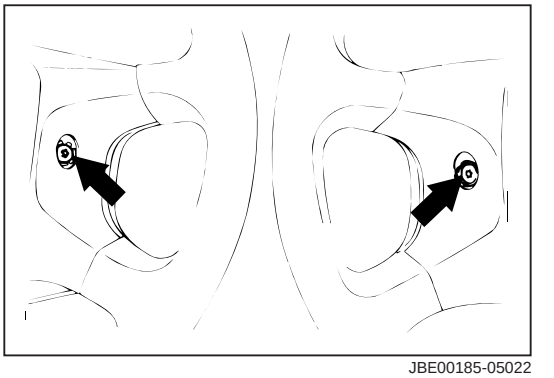
3. Separate the pad assembly and steering wheel.
   Disconnect the connector for the air bag and connector for the horn provided at the reverse side of the pad assembly.
   WARNING:
   - Never resume the operation within 60 seconds after the power supply has been cut off, during which the backup condenser is discharged.



JBE00183-05020

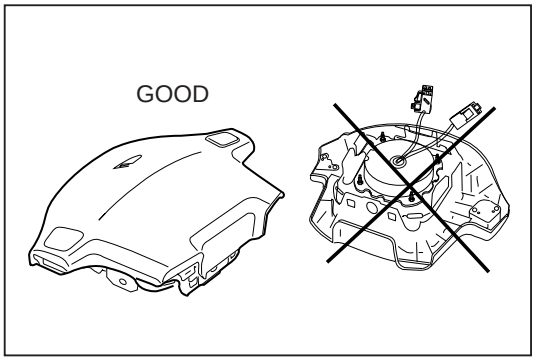


JBE00184-05021



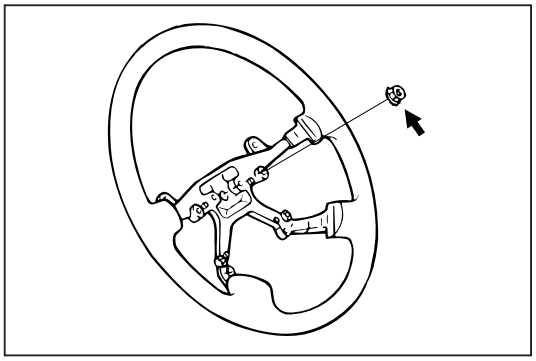
JBE00185-05022

4. After each connector is disconnected, remove the pad assembly from the steering wheel.
   WARNING:
   - Be sure to place the removed pad assembly with the pad surface facing upward. The pad assembly placed with the pad surface facing downward is potentially hazard. Failure to observe this caution may cause unexpected deployment of the air bag, resulting in scattered pad assembly. Furthermore, store the pad assembly at a low place close to the ground level where no heat source (80°C or more) exists in close proximity.

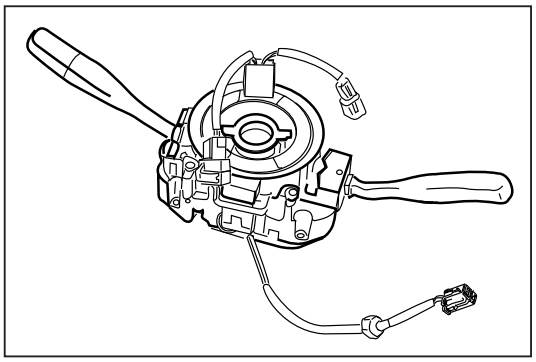


JBE00186-05023

5. Ensure that the steering wheel is set to a straight-ahead position.
6. Remove the lock nut of the steering wheel.
7. Remove the steering wheel.
8. Remove the instrument finish lower panel by the removing attaching screws.
9. Remove the steering column lower cover by the removing attaching screws.
10. Disconnect the connector and detach the wiring harness from the clamp.


JBE00187-05024

11. Remove the multi-use lever switch by removing the attaching screws.
    NOTE:
    - There are cases where the multi-use lever switch can not be removed from the steering column upper cover, unless the steering column is lowered by temporarily loosening the attaching bolts of the column.


JBE00188-05025

INSTALLATION

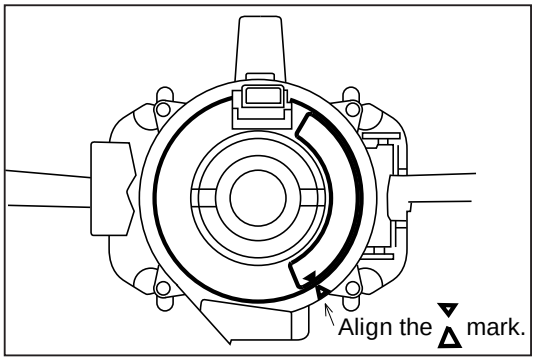
PRECAUTION:
- It should be noted wrong installation of the steering roll connector may pose potential hazard, for it may break the wire and also, prevent proper turning of the steering wheel.

1. Ensure that the front wheels are set to the straight-ahead position.
2. Secure the steering roll connector to the multi-use lever switch with screws.

JBE00189-05026

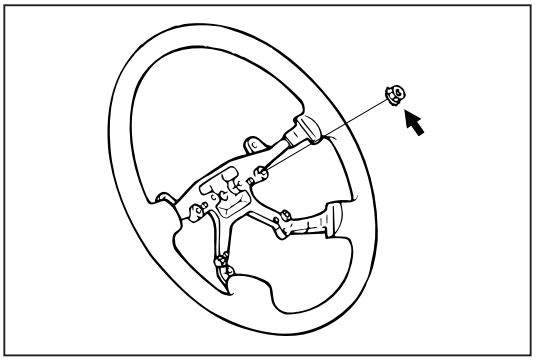
3. Turn the steering roll connector clockwise, until it is locked.
   CAUTION:
   - The steering roll connector makes five turns at the maximum. Hence, when the steering roll connector is connected to the steering wheel, be sure to set the steering roll connector to the midpoint of the rotation.

4. Back off the steering roll connector about 2.5 turns counterclockwise from the locked position. Align the center mark. Temporarily secure the steering roll connector, using a tape, so that it may not move.



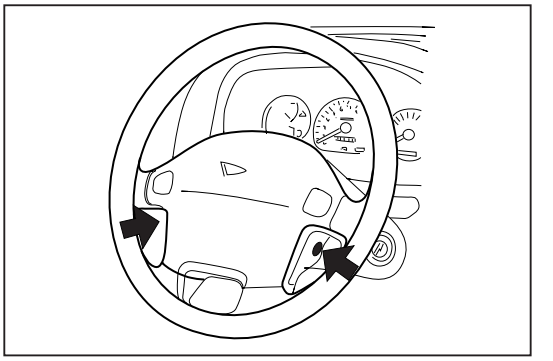
JBE00190-05027

5. Install the steering wheel assembly to the steering shaft and tighten the lock nut.
   Specified Torque: 27.5 - 41.2 N·m



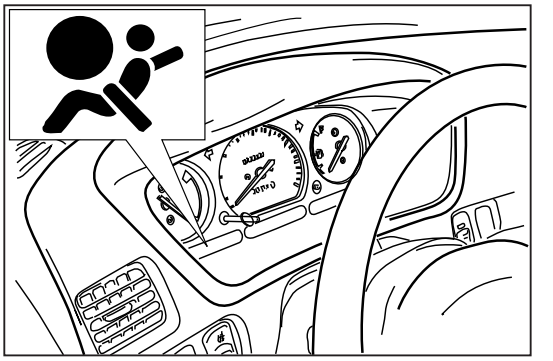
JBE00191-05028

6. Installation of pad assembly
   (1) Connect the connector.
   (2) Secure the pad assembly to the steering wheel assembly with the TORX® bolt.
   Specified Torque: 5.2 - 9.5 N·m



JBE00192-05029

7. Set the steering column upper cover to the steering column assembly.
8. Tighten the steering column assembly attaching bolts.
9. Connect the air bag connector. Clamp the wiring harness.
10. Install the steering column lower cover.
11. Install the instrument finish lower panel.



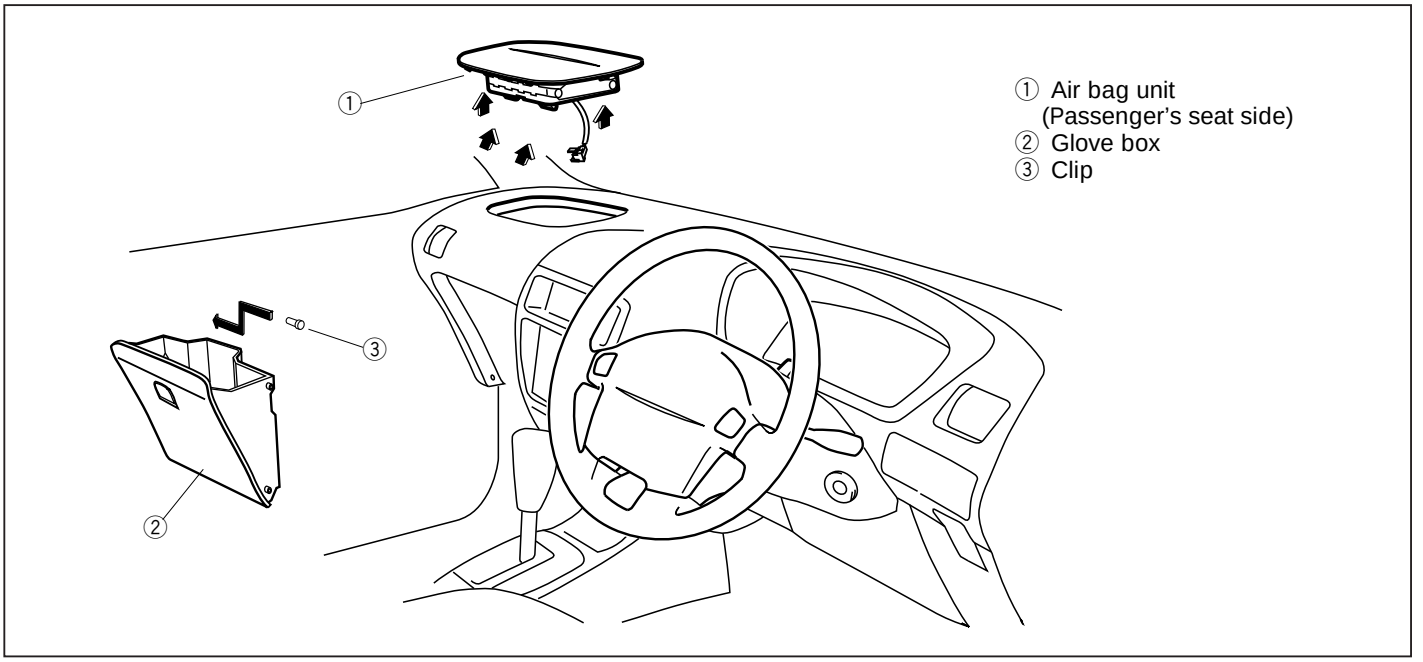
JBE00193-05030

CHECK AFTER INSTALLATION

1. Turn the steering wheel to the right and left sides, respectively, as far as it will go. Ensure that no malfunction exists.
2. Connect the negative (–) terminal of the battery cable to the battery terminal.
3. Ensure that the horn is set off by pushing the horn button.
4. Turn on the ignition switch. Ensure that the air bag warning lamp illuminates for six seconds.

AIR BAG UNIT (FRONT PASSENGER'S SEAT SIDE)

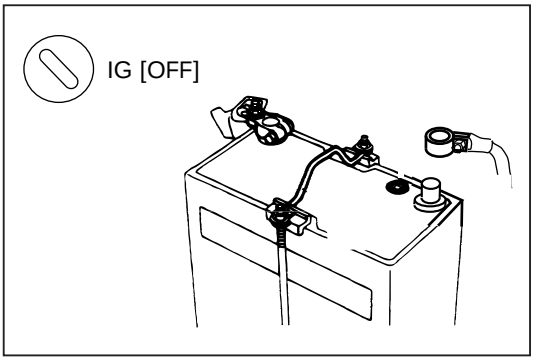
COMPONENTS



JBE00194-05031

REMOVAL

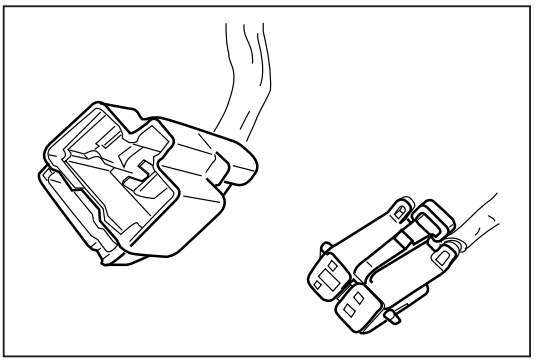
1. Turn off the ignition switch and detach the negative (–) terminal of the battery cable from the battery terminal.
2. Remove the grove box by removing a hinge pin.
3. Disconnect the connector which connects the wire harness of the air bag unit and the cowl wire.



JBE00195-05032

WARNING:

- Be sure to start the operation 60 seconds after the power supply is cut off. Failure to observe this warning may cause unexpected deployment of the air bag owing to impacts, etc. during the removal.
- Never bring your face, arms and body to the front of the air bag unit during the removal.
- If the air bag unit is dropped or damaged during the removal or the storage, be sure to dispose of the unit according to the disposal procedure. Be sure to mount a new unit to the vehicle.



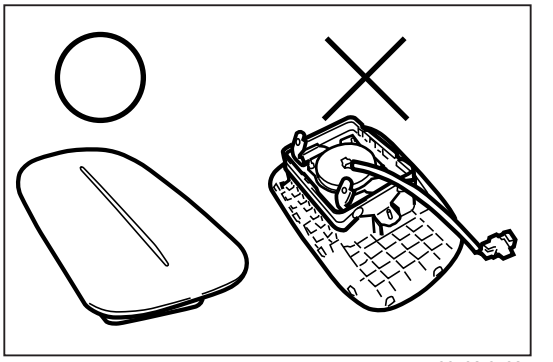
JBE00196-05033

CAUTION:

- It should be noted that, when the negative (–) terminal of the battery is detached, the memory of the ECU control of the other system will be erased at the same time.

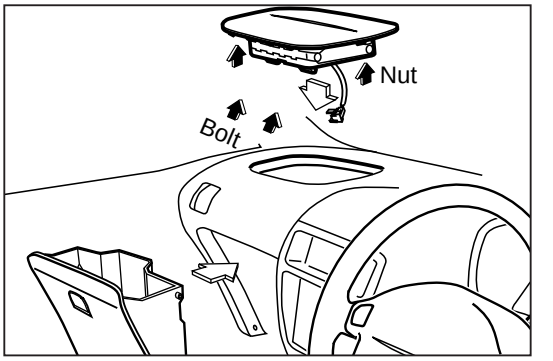
JBE00197-05034

4. Remove the air bag unit assembly from the instrument panel by removing attaching bolts and nuts.
   WARNING:
   - Be sure to place the removed air bag unit with the pad surface facing upward. The unit placed with the pad surface facing downward is potentially hazard. Failure to observe this caution may cause unexpected deployment of the air bag, resulting in scattered air bag unit. Furthermore, store the unit at a low place close to the ground level where no heat source (80°C or more) exists in close proximity.


JBE00198-05035

INSTALLATION

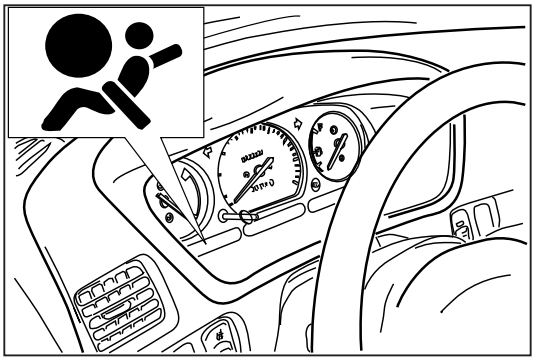
1. Install the air bag unit to the instrument panel and tighten the bolts and nuts.
   Specified Torque for the Bolt: 6.7 - 9.5 N·m
2. Connect the connector.
3. Install the grove box.



JBE00199-05036

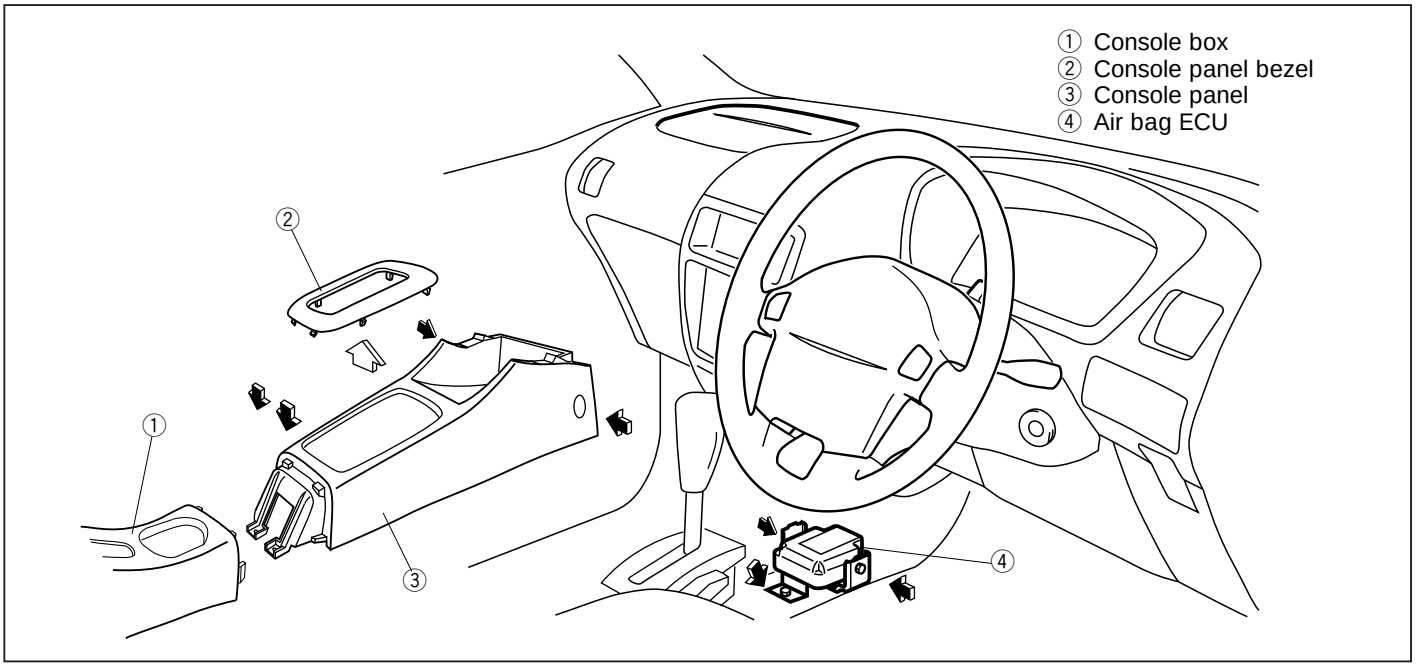
CHECK AFTER INSTALLATION

1. Ensure that the pad of the air bag unit fits properly to the instrument panel.
2. Connect the negative (–) terminal of the battery cable to the battery terminal.
3. Turn on the ignition switch. Ensure that the air bag warning lamp illuminates for six seconds.


JBE00200-05037

AIR BAG ECU

COMPONENTS

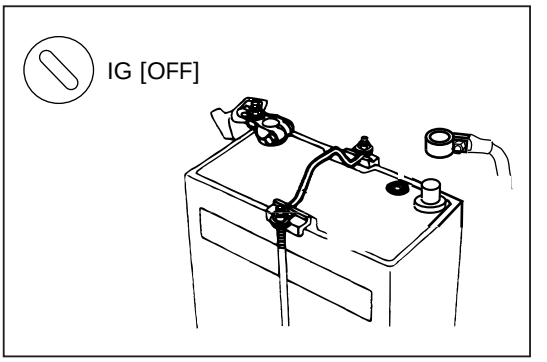


JBE00201-05038

REMOVAL

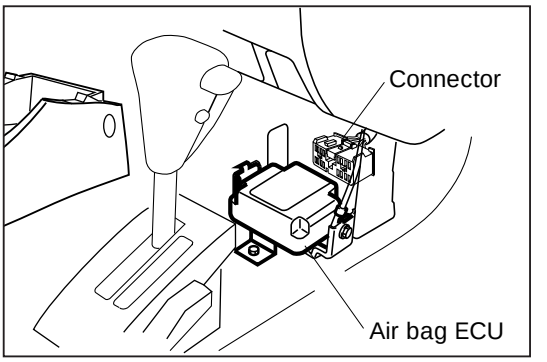
1. Turn off the ignition switch and detach the negative (–) terminal of the battery cable from the battery terminal.
   WARNING:
   - Be sure to start the operation 60 seconds after the power supply is cut off. Failure to observe this warning may cause unexpected deployment of the air bag owing to impacts, etc. during the removal.

   CAUTION:
   - It should be noted that, when the negative (–) terminal of the battery is detached, the memory of the ECU control of the other system will be erased at the same time.



JBE00202-05039

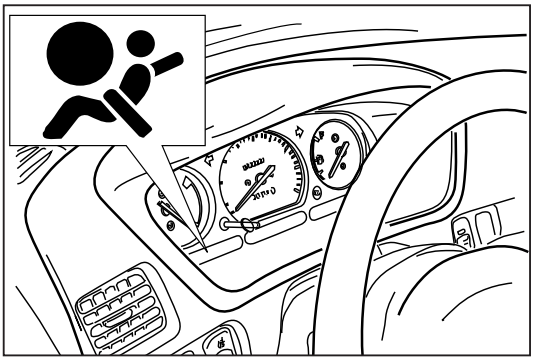
2. Remove the rear console box by removing attaching screws.
3. Pull off the console panel bezel.
4. Remove the console panel by removing attaching bolts and clips.
5. Disconnect the connector from the air bag ECU.
6. Remove the air bag ECU by removing attaching bolts.
   WARNING:
   - Disconnect the connector in advance.



JBE0203-05040

INSTALLATION

1. Install the air bag ECU.
2. Connect the connector.
3. Install the console panel.

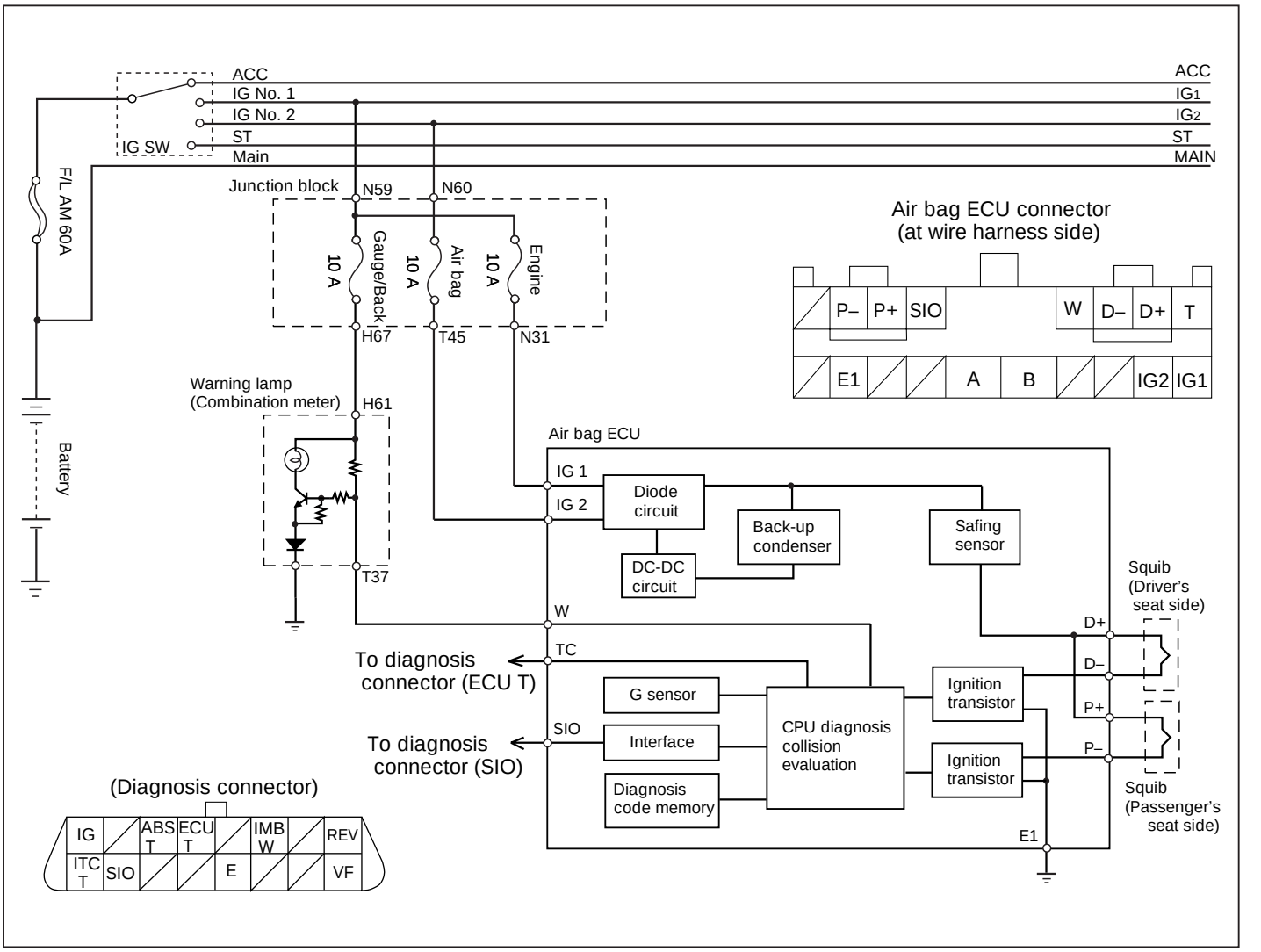


JBE00204-05041

CHECK AFTER INSTALLATION

1. Connect the negative (–) terminal of the battery cable to the battery terminal.
2. Turn on the ignition switch. Ensure that the air bag warning lamp illuminates for six seconds.

CIRCUIT DIAGRAM

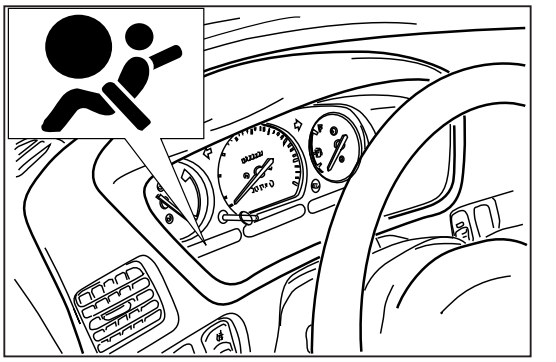


JBE00205-05042

DIAGNOSIS CHECK

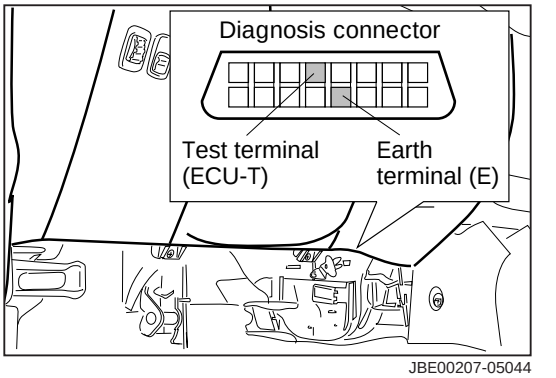
CONFIRMATION PROCEDURE FOR DIAGNOSIS CODES

1. Turn on the ignition switch.
2. If the air bag warning lamp goes on for approximately six seconds and goes out afterward, the system is functioning properly.
   NOTE:
   - If the lamp will not go on at this time, refer to page BE–63.



JBE00206-05043

3. If the warning lamp keeps illuminated for more than six seconds, it means a certain system malfunctioning is being detected. Proceed to the following operations.
4. Connect the test terminal (ECU-T) and the earth terminal (E) of check connector with a jump wire.
5. Confirm the diagnosis code by reading the number of flashing of the air bag warning lamp.

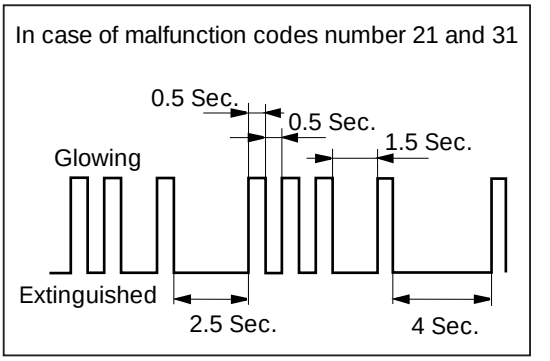


JBE00207-05044

Reading of malfunction codes (diagnosis codes)

When two or more malfunction codes are outputted, the codes are indicated in the sequence of the code numbers, starting form a smaller number, with a four-second distinguished period interposed between codes.

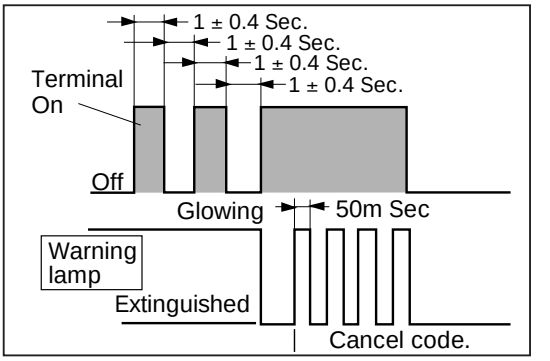
After a lapse of four seconds, the malfunction codes are indicated by the repetition of a 0.5-second glowing period and a 0.5-second extinguished period. If the code is a two-digit number, a 1.5-second extinguished period is interposed between the units digit and the tens digit.



JBE00208-05045

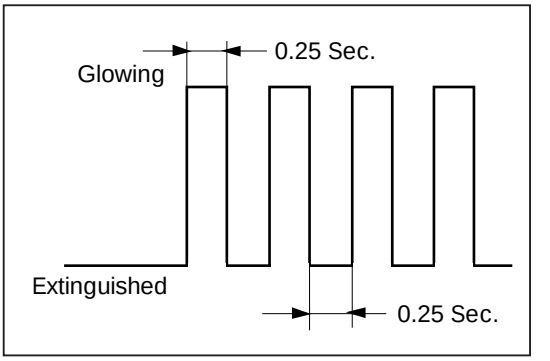
Canceling procedure for records of diagnosis codes

1. The diagnosis codes can be canceled by connecting repeatedly the test terminal (ECU-T) with the earth terminal (E) at the intervals shown in the figure.



JBE00209-05046

2. When the malfunction has been remedied and the system has resumed, the normal code shown in the figure is indicated.
   NOTE:
   - The cancellation procedure for the malfunction record can not be applied to the cancellation of the record of the malfunction for the ECU internal circuit. (Diagnosis codes number 61 and 62)



JBE00210-05047

ABNORMAL ILLUMINATION OF WARNING LAMP

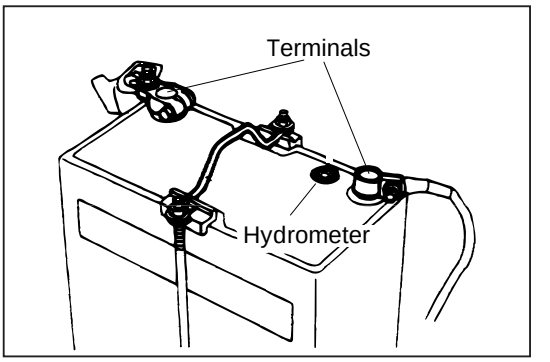
When warning lamp will not go on:

If the warning lamp will not go on when the ignition switch is turned on, check the following items.

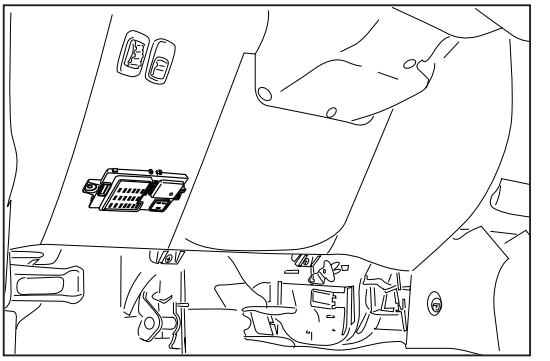
(1) Battery for defects or insufficient charge
(2) Battery cable for poor connection
(3) Warning lamp bulb for being burnt out
(4) Gauge fuse for open wire
(5) Cowl wire harness between warning lamp and air bag ECU for abnormality
(6) Warning lamp relay for malfunction

NOTE:

- When the gauge fuse has open wire, other warning lamps will not go on.



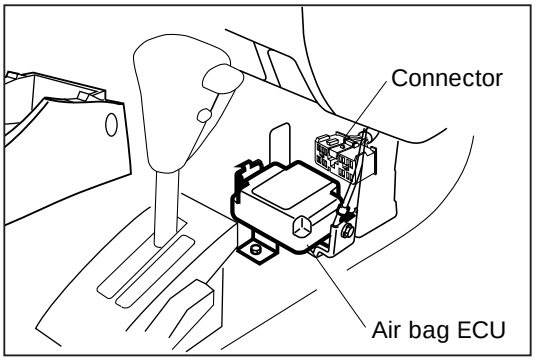
JBE00211-05048



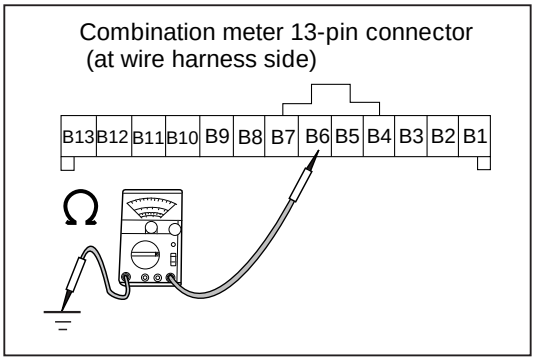
JBE00000-05049

1. Check of cowl wire harness
   (1) Turn off the ignition switch and wait for 60 seconds.
   (2) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU connector.
   (3) Turn on the ignition switch. Check to see if the warning lamp goes on.
   NOTE:
   • When there is open wire in the wire harness between the warning lamp circuit inside the combination meter and the ECU, the warning lamp remains illuminated.

   (4) If the warning lamp will not go on in the condition (3), it is likely that the harness of warning lamp is shorted. Remove the combination meter and disconnect the 13–pin connector. Measure the resistance of harness (cowl wire) across the terminal (B6) and body earth.
   (5) If it might be shorted, replace the harness. Then turn on the ignition switch. Check to see if the warning lamp goes on.

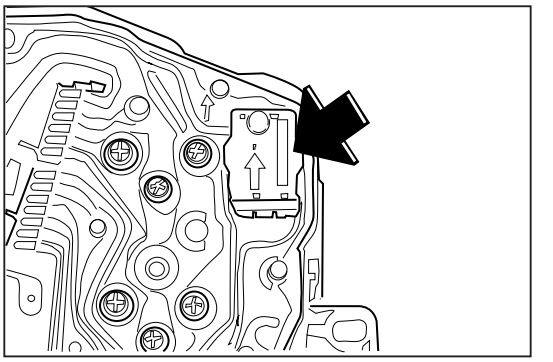


JBE00212-05050

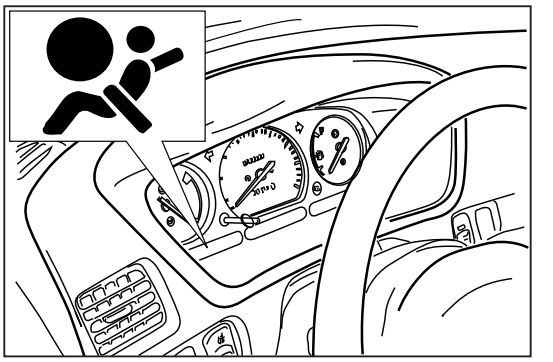


JBE00213-05051

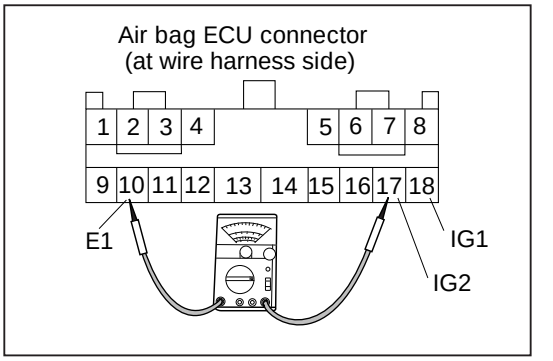
2. Check of air bag warning lamp relay
   If the air bag warning lamp will not go on in the condition (5) above, it means the relay is malfunctioning. Replace the relay.


JBE00214-05052

When warning lamp will not go out:
If the warning lamp will not go out even if about six seconds have elapsed after the ignition switch was turned on, malfunction is most likely taking place in the system. However, as for the following items given below, the malfunction codes can not be read by the reading procedure for the malfunction code already described before, and the warning lamp will remain illuminated. At this time, proceed to the following inspection.


JBE00215-05053

1. Malfunction of power supply circuit of air bag ECU
   (1) Turn off the ignition switch and wait for 60 seconds.
   (2) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU.
   (3) Set the range of the circuit tester to the voltmeter mode. Connect the tester to the terminals of the connector at the wire harness side.
   (4) Switch on the ignition switch and take a reading of the voltage.
   NOTE:
   • If the specified voltage (12 V) is applied across the terminal 17 or 18 and the terminal 10, the power supply circuit is regarded as normal and proceed to the next step.
   • If the specified voltage is not applied, check the wiring route including the connector and fuse for open wire.

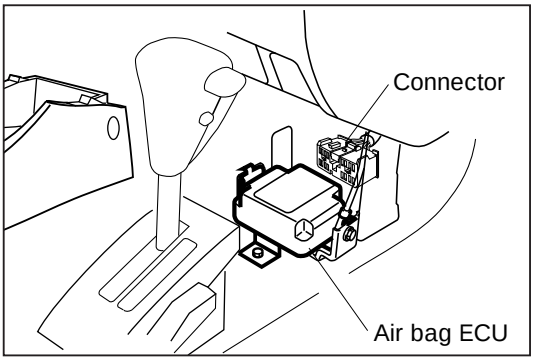


JBE00216-05054

2. Check of warning lamp circuit
   NOTE:
   - If the warning lamp circuit has open wire, the warning lamp will remain illuminated. This malfunction is recorded as the malfunction code 16 of the air bag ECU.
   - However, as long as the warning lamp circuit has open wire, the diagnosis code can not be indicated and the warning lamp remains illuminated.

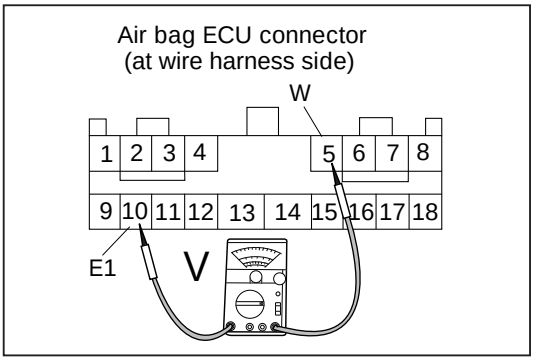
JBE00217-05055

   (1) Turn off the ignition switch and wait for 60 seconds.
   (2) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU.



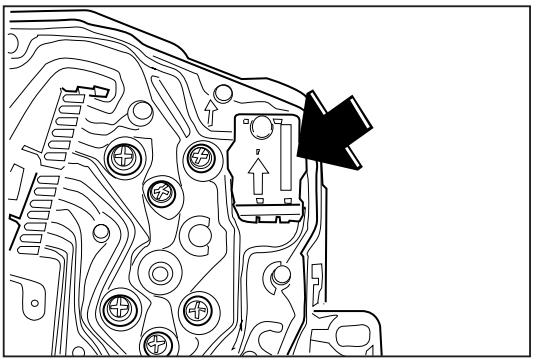
JBE00218-05056

   (3) Set the range of the circuit tester to the voltmeter mode. Connect the tester to the terminals of the connector at the wire harness side.
   NOTE:
   - If the specified voltage (5.5 ± 0.5 V) is applied across the terminal 5 and the terminal 10 (body earth) circuits except the ECU are regarded as functioning normally.



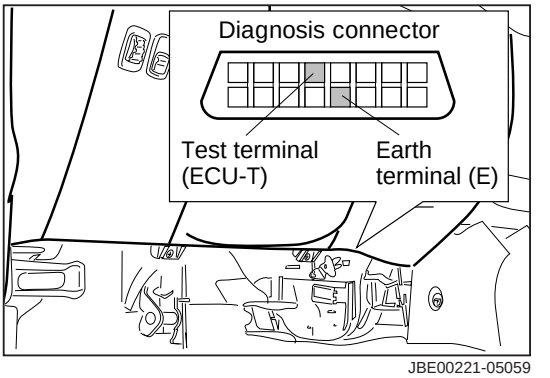
JBE00219-05057

3. Replacement of air bag warning lamp relay
   (1) Remove the combination meter from the instrument panel.
   (2) Check to see if there is open wire or damage at the circuit panel at the back side of the combination meter.
   (3) Replace the air bag warning lamp relay inside the combination meter.
   (4) Then, perform the check of (3) and check that the lamp goes out.
   NOTE:
   - After completion of repairing the malfunction, read out the malfunction codes and cancel them to complete the operation.



JBE00220-05058

   (5) Connect the wire harness connector to the ECU as it was connected before. Perform code cancellation and re-reading. Make sure that the malfunction has been remedied.



JBE00221-05059

TROUBLE SHOOTING

When proceeding with operations for a malfunctioning vehicle, it is imperative to confirm the malfunction phenomena actually before pinpointing the causes. In order to reproduce the malfunction phenomena, collecting information from the customer is of great importance.

WARNING:

- The aforesaid describes general notes. In the air bag system, there are some cases where the malfunction phenomena can not be reproduced due to the characteristics of the system. Therefore, any wrong operations during checks and repairs may cause the air bag to function accidentally and deploy. Please observe the notes and perform the operations according to the instructions given in the manual.

JBE00222-05060

LIST OF MALFUNCTION CODES

Code No.	Timing at time of Malfunctioning sections	Malfunction detection No.
11	At all times	Abnormal Power supply voltage
14	At all times	IG1 has open wire.
15	At all times	IG2 has open wire.
16	Initial period	Abnormal warning lamp illumination circuit
21	At all times	Squib of air bag at driver's seat side has open wire.
22	At all times	Circuit of squib of air bag at driver's seat side is shorted.
31	At all times	Squib of air bag at front passenger's seat side has open wire.
32	At all times	Circuit of squib of air bag at front passenger's seat side is shorted.
41	At all times	Upstream circuit of squib of air bag is grounded to earth.
42	At all times	Power supply voltage is applied to upstream circuit of squib of air bag.
61	Initial period	Squib was operated. (Air bag was deployed.)
62	Initial period/ At all times	Air bag ECU malfunctioning

JBE00223-05061

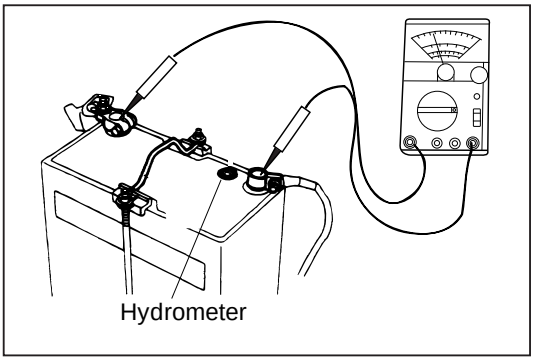
CAUTION:

- After carrying out the trouble shooting according to diagnosis codes, cancel the diagnosis codes by following the code canceling method described at page BE–63.
- Even though the malfunction has been remedied, the code is not canceled automatically.

JBE00224-05062

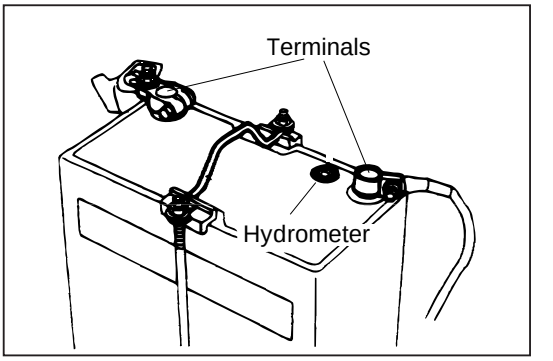
When diagnosis code 11,14 or 15 is indicated:
Possible cause for malfunction: Abnormal power supply voltage to the air bag system.

1. Battery check
   Turn off the ignition switch. Measure the voltage across the battery terminals and ensure that the voltage is 12 V or more.



JBE00225-05063

2. Check of charging circuit
   (1) After starting the engine, disconnect the battery cable terminal from the negative terminal of the battery.
   (2) Measure the voltage between the negative terminal of the disconnected battery cable and the battery positive terminal.

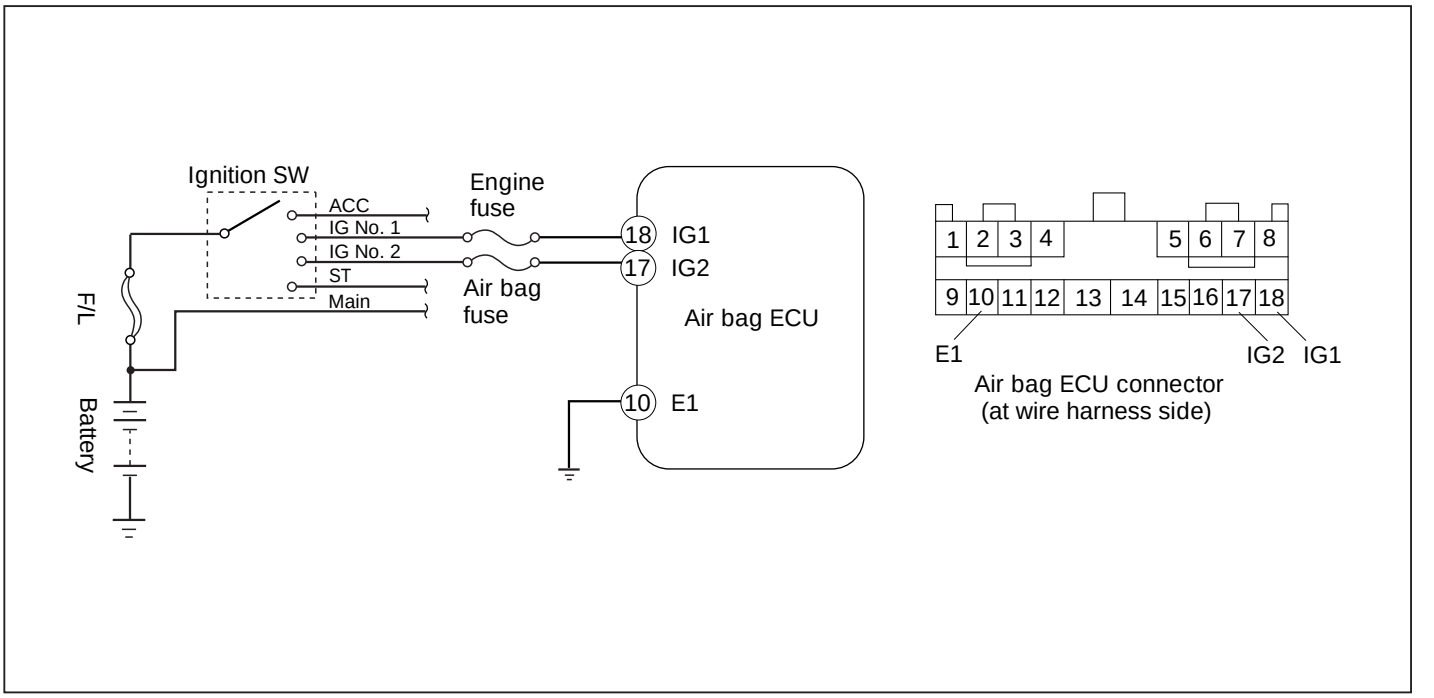


JBE00226-05064

   NOTE:
   • The voltage should be 14.5 V or more at the engine revolution speed of 2000 rpm.

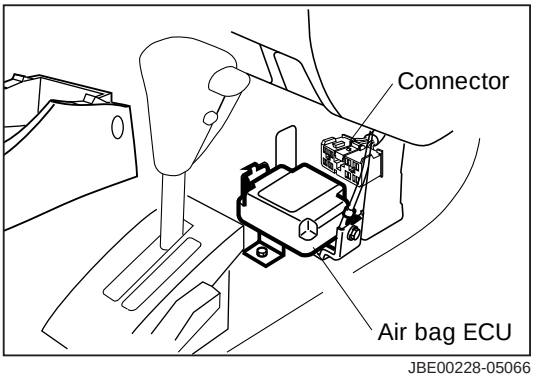
   (3) Check to see if the battery cable is connected properly.

3. Check of wire harness and fuse



JBE00227-05065

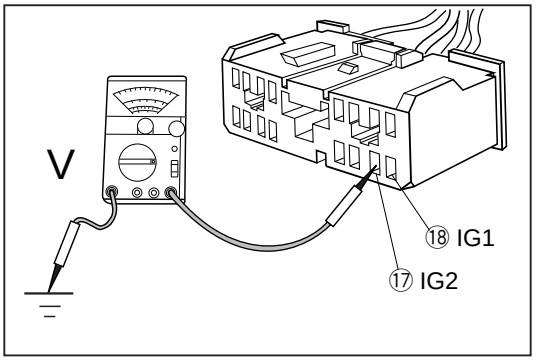
   (1) Turn off the ignition switch and wait for 60 seconds.
   (2) Remove the console panel. Disconnect the connector at vehicle wire harness side from the air bag ECU.



JBE00228-05066

(3) Turn on the ignition switch.
With the circuit tester set to the voltmeter mode, connect the tester between the connector terminal at the vehicle wire harness side and body earth.
Between terminal 18 (IG1) and body earth:
Battery voltage
Between terminal 17 (IG2) and body earth:
Battery voltage

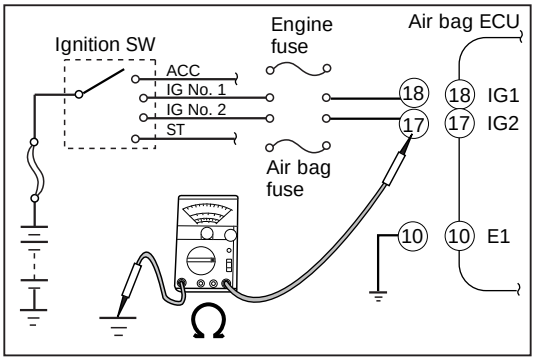
If the battery voltage is not applied to each terminal, pull off and check the air bag fuse and engine fuse.



JBE00229-05067

(4) If the fuse is melt down, connect the tester between the connector terminal at the vehicle wire harness side and body earth with the tester set to the ohmmeter range.
Between terminal 18 (IG1) and body earth:
No continuity exists.
Between terminal 17 (IG2) and body earth:
No continuity exists.

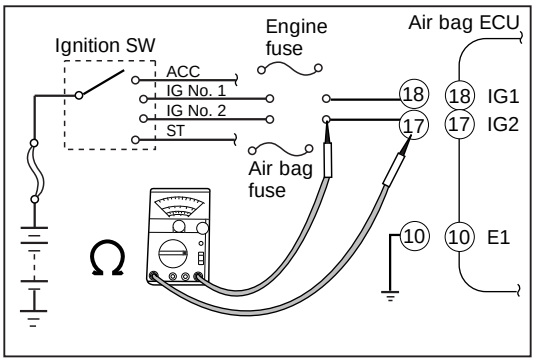
If it might be shorted, replace the harness. If not, re-check after replacing the fuse.



JBE00230-05068

(5) If the fuse is not melt down, connect the tester between the connector terminal at the vehicle wire harness side and fuse terminal with the tester set to the ohmmeter range.
Between terminal 18 (IG1) and Engine fuse terminal (at the fuse block): Continuity exists.
Between terminal 17 (IG2) and Air bag fuse terminal (at the fuse block): Continuity exists.

If it might have open wire, replace the harness. If not, re-check the battery and charging circuit.



JBE00231-05069

When diagnosis code 16 is indicated:

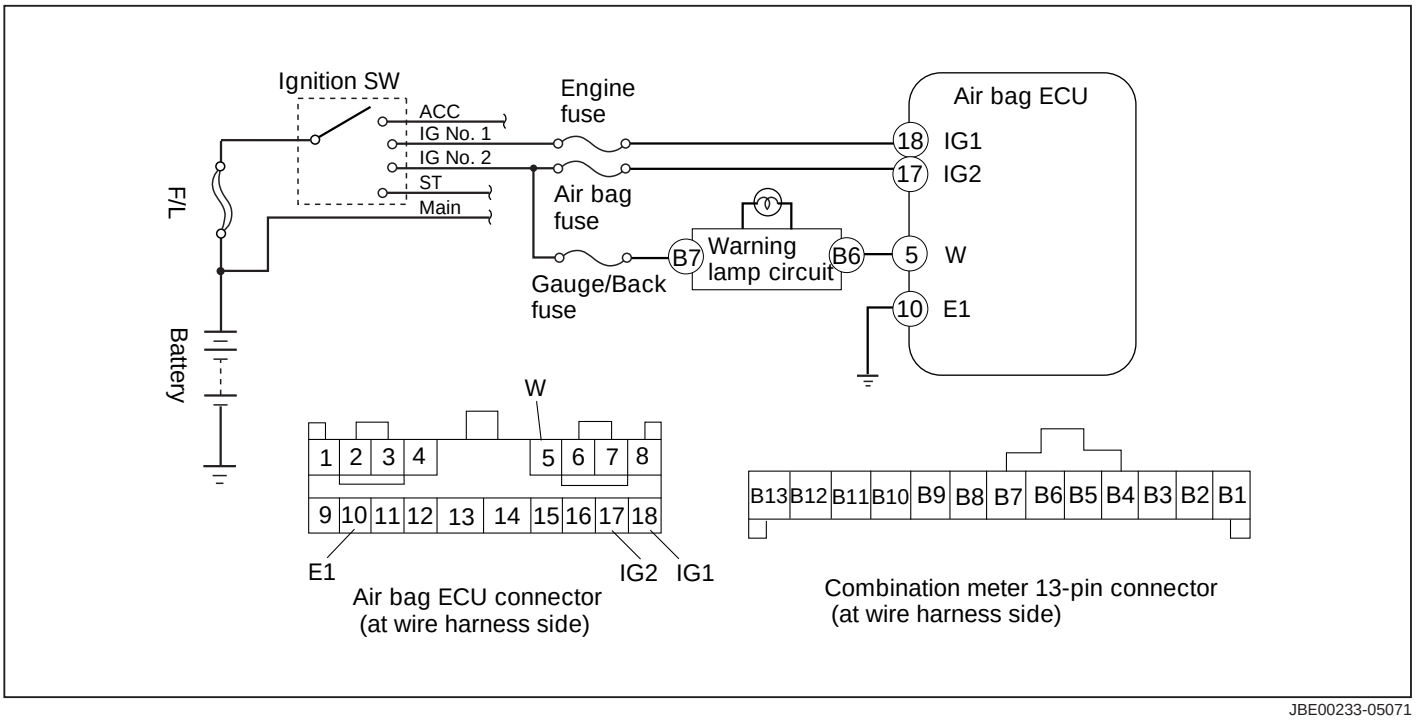
Possible cause for malfunction: Abnormality in warning lamp illuminating circuit

NOTE:

- When this code is memorized, it indicates that open wire has taken place in the warning lamp circuit even though it occurred temporarily. However, if this code is now indicated, it means the circuit (wire harnesses, connectors, etc.) has been remedied to the normal condition.

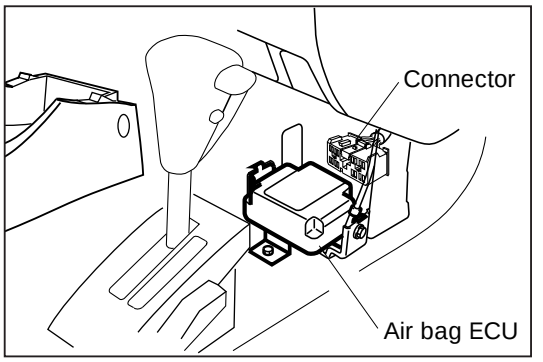
JBE00232-05070

1. Check of wire harness and connector



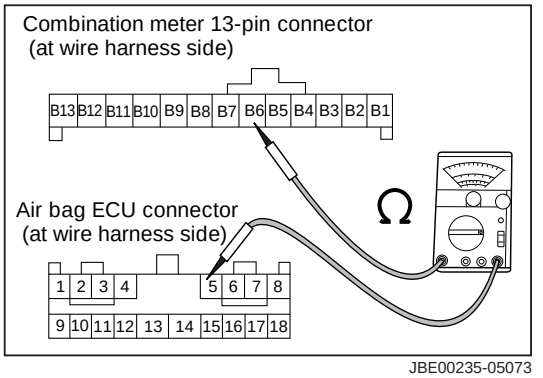
JBE00233-05071

(1) Turn off the ignition switch and wait for 60 seconds.
(2) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU connector.
(3) Take out the combination meter from the instrument panel. Disconnect the 13-pin connector from the combination meter.



JBE00234-05072

(4) Connect a circuit tester to the wire harness connectors between the terminal (B6) to the combination meter side and the terminal (5) to the ECU side with the circuit tester set to the ohmmeter mode. Check continuity between these terminals. Give light vibration to the wire harness or connector between the air bag ECU and the combination meter by hand. Check to see if any change is observed in the ohmmeter.

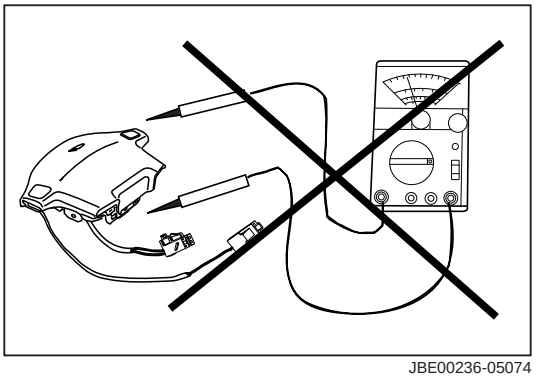


JBE00235-05073

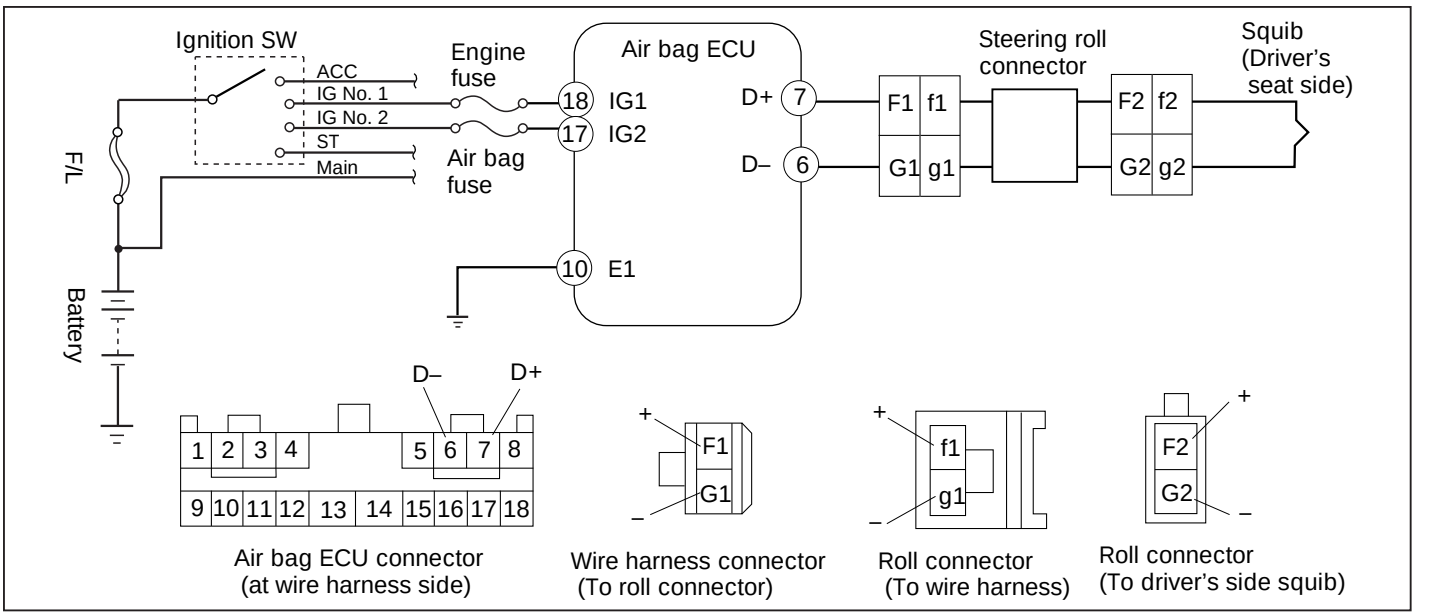
When diagnosis code 21 is indicated:
Possible cause for malfunction: Open wire in squib of air bag at driver's seat side

WARNING:

- The squib of the air bag consists of a filament of about 2 ohms. Therefore, there is the possibility that a current which is big enough to cause deployment flows when the circuit tester is connected in its ohmmeter mode.
- Hence, never measure the resistance of the squib easily just because the code 21 is indicated. This may cause the air bag to deploy, thus causing serious injuries to the operators and other people in the surrounding.


JBE00236-05074

1. Check of wiring harness and connector



JBE00237-05075

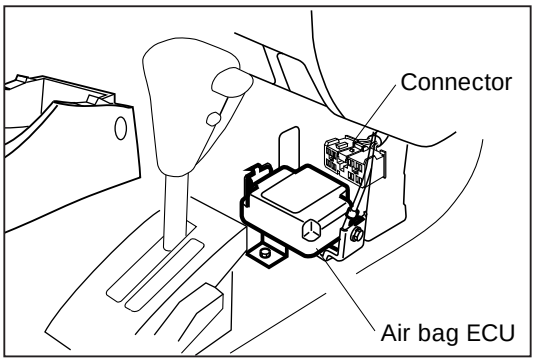
NOTE:

- When there is poor connection between the air bag ECU and the squib, the code 21 is indicated, too.

(1) Turn off the ignition switch and wait for 60 seconds.
(2) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU.

NOTE:

- When the connector is disconnected from the air bag ECU, the connector terminals 6 and 7 at the harness side are shorted automatically by the short circuit bridge.

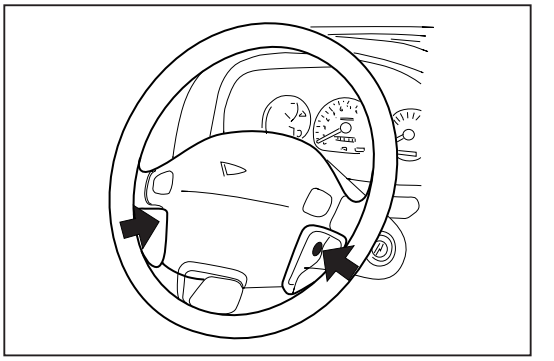


JBE00238-05076

(3) Remove the steering pad assembly (air bag unit) from the steering wheel.

CAUTION:

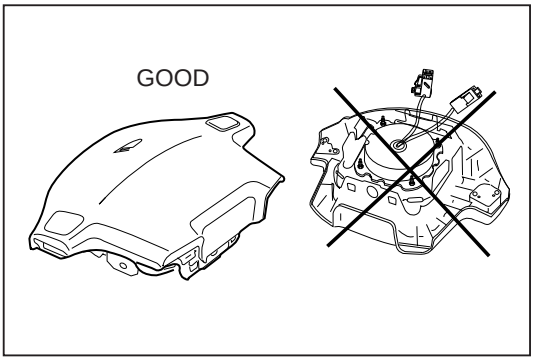
- The pad assembly is installed to the steering wheel by means of TORX® bolts.
- A pad assembly which was dropped previously can not be used again. Therefore, extreme care must be exercised as to its handling.


JBE00239-05077

(4) Disconnect the pad assembly connector from the roll connector. Also disconnect the connector for the horn.

WARNING:

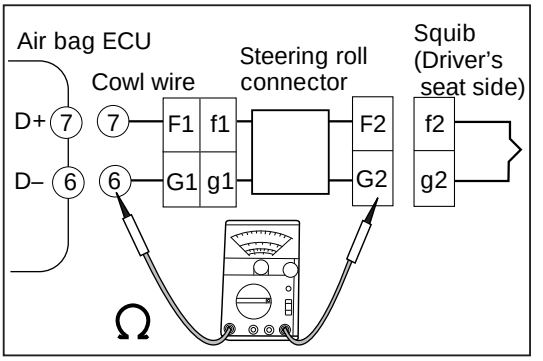
- When storing the steering pad assembly (air bag unit), be sure to place it with the pad surface facing upward on a flat place which is not exposed to direct sun rays. Sparks of welding, etc. shall be kept away from the storing place. Also, the storing place shall be away from the storing place for water, oil, grease, etc.



JBE00240-05078

(5) Connect the circuit tester to the roll connector terminal with the tester set to the ohmmeter range. Ensure that there is no open wire between the wire harness and the connector.
Between terminal 7 (D+) and F2 (+):
Continuity exists.
Between terminal 6 (D–) and G2 (–):
Continuity exists.

(6) If there is no open wire, connect both ends of the roll connector terminal with a jump wire to short them.



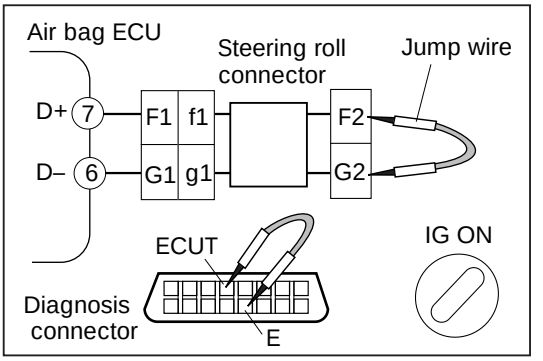
JBE00241-05079

(7) Connect the connector at the vehicle wire harness side and the air bag ECU that were disconnected at Step (2).

(8) Turn on the ignition switch and take a reading of the diagnosis code.

CAUTION:

- If the code 22 (short circuit of squib circuit) is indicated, it proves indirectly that there is open wire in the squib of the steering pad assembly (air bag unit). Therefore, replace the steering pad assembly.
- After the replacement, cancel the diagnosis code and confirm that the code 21 is not outputted any more.



JBE00242-05080

2. Confirmation of open wire of squib

CAUTION:

- To check an electric circuit for open wire, it is an accepted practice to perform measurement with an ohmmeter. However, it is dangerous to use this method to check the squib for open wire, because this method may cause an accidental explosion. In the preceding step, it has been confirmed that there is no open wire in the circuits other than the squib. Before you proceed to the disposing procedure for the steering pad assembly described later, it is, however, necessary to prove directly that there is open wire in the squib. As for this procedure, refer to page BE–83.

JBE00243-05081

3. Installation of steering pad assembly

JBE00244-05082

When diagnosis code 22 is indicated:

Possible cause for malfunction: Circuit of squib of air bag at driver's seat side is shorted.

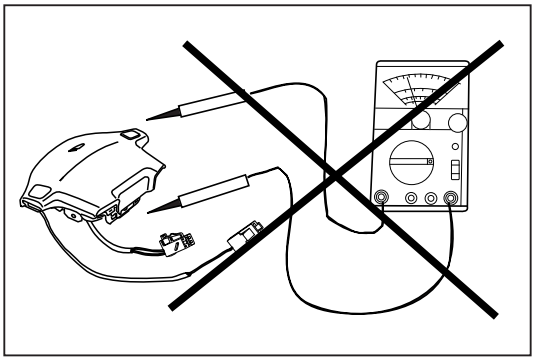
NOTE:

- The squib of the air bag consists of a filament of about 2 ohms. In order to detect open wire or short circuit in the squib circuit, a small amount of current is flown at all times from the air bag ECU. Therefore, when this code is indicated, it means that an abnormally large amount of current flowed in the squib circuit of the air bag at the driver's seat for a certain reason. Therefore, the ECU judges that the resistor of the squib (filament or wire harness) is shorted.

JBE00245-05083

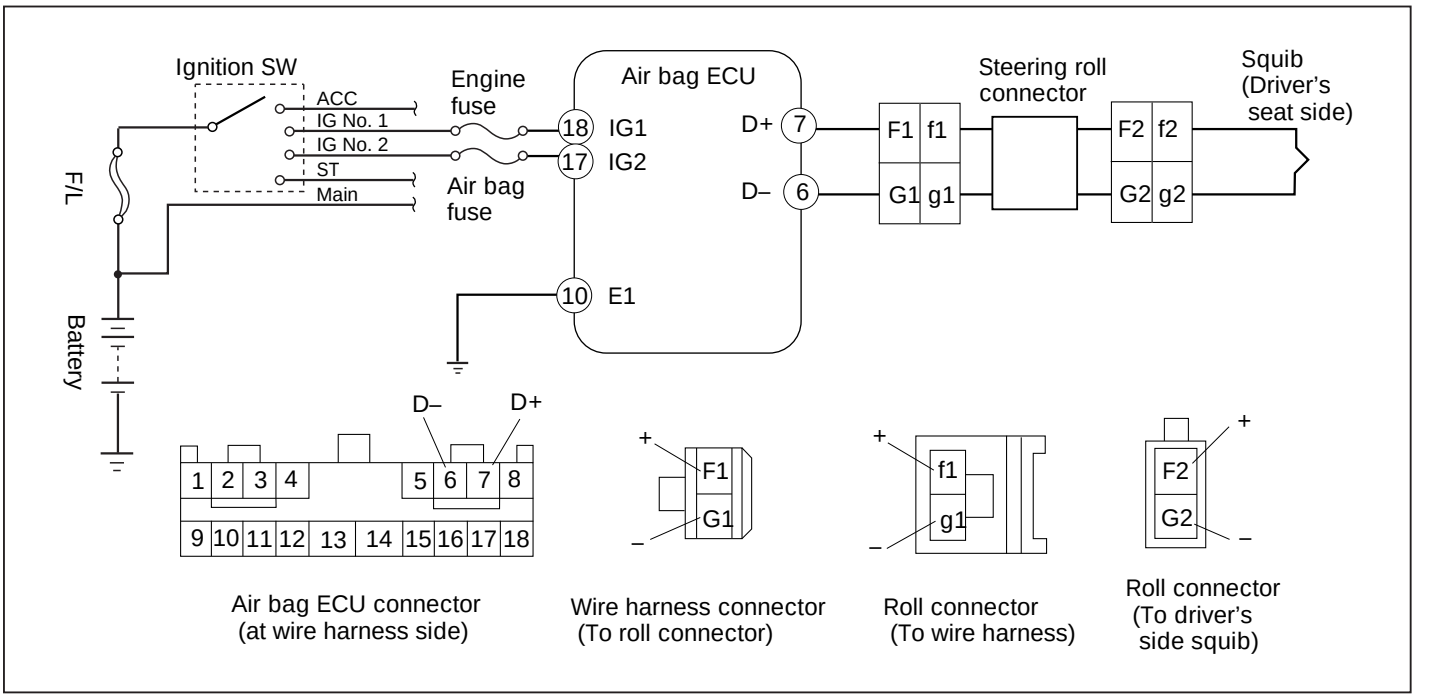
WARNING:

- Never measure directly the resistance of the squib to see if the squib is shorted or not, using a circuit tester. Failure to observe this warning may cause the air bag to deploy accidentally, thus causing injuries to the operators and other people in the surrounding.



JBE00246-05084

1. Check of wiring harness



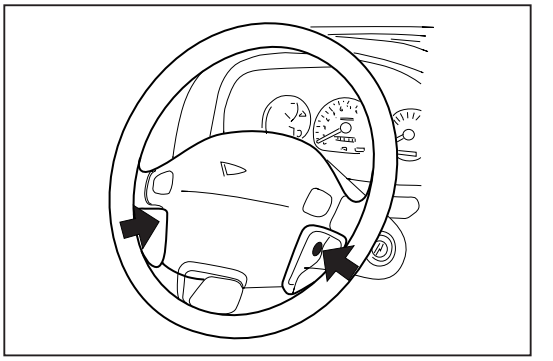
JBE00247-05085

(1) Turn off the ignition switch and wait for about 60 seconds.

(2) Remove the steering pad assembly (air bag unit) from the steering wheel.

CAUTION:

- A steering pad assembly which was dropped previously can not be used again. Therefore, extreme care must be exercised not to drop it.

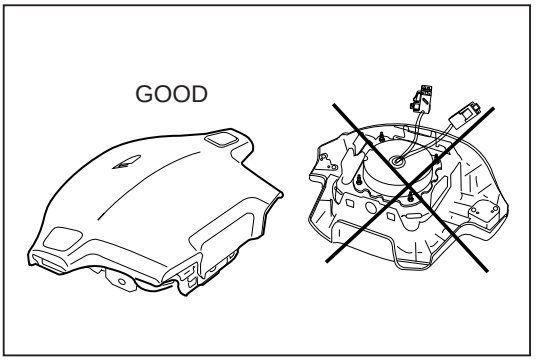


JBE00248-05086

(3) Disconnect the connector of the steering pad assembly from the roll connector. Also disconnect the connector for the horn.

WARNING:

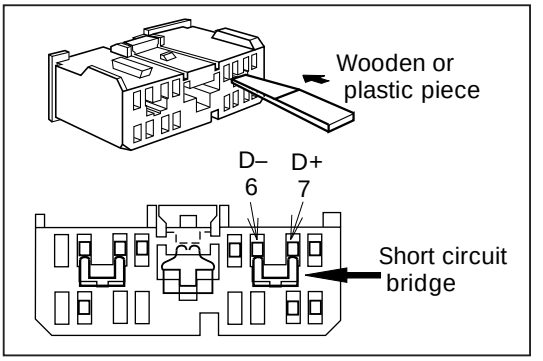
- When storing the steering pad assembly (air bag unit), be sure to place it with the pad surface facing upward on a flat place which is not exposed to direct sun rays. Also the storing place shall be away from water and rain.



JBE00249-05087

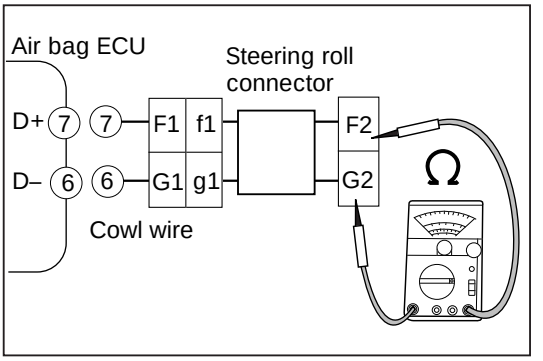
(4) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU.

(5) Using a wooden or plastic piece, raise the short circuit bridge at the sections 6 and 7 of the connector at the vehicle wire harness side which was removed from the ECU. In this way, disconnect the shorted contact points.



JBE00250-05088

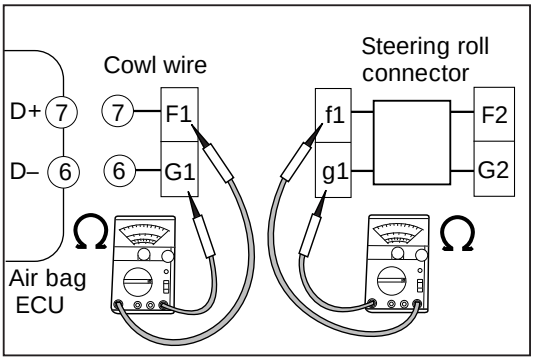
(6) With the circuit tester set to the ohmmeter mode, connect the tester to the roll connector terminal. Check to see if any short circuit exists in the circuits from the air bag ECU to the roll connector via the wire harness.
Between terminal F2 (+) and G2 (–):
No continuity exists.



JBE00251-05089

(7) If the wiring harness is shorted, it is necessary to know whether the faulty point is attributable to the inside of the roll connector. To this end, disconnect the coupling connector of the roll connector and the wire cowl. Then, perform check with a circuit tester as was described in Item (6) above.
Between terminal F1 (+) and G1 (–):
No continuity exists.
Between terminal f1 (+) and g1 (–):
No continuity exists.

If a short circuit is found, replace the faulty part with a new one.



JBE00252-05090

NOTE:

- At this time, turn the steering wheel in a right-and-left direction and ensure that there is no change in the indication of the circuit tester.

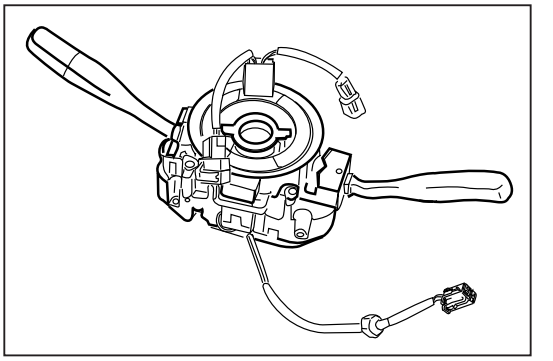
(8) Replacement of roll connector

WARNING:

- When replacing the roll connector, refer to BE-57. Failure to observe this warning may hamper the turning function of the steering wheel or cut the wiring of the roll connector. Therefore, extreme care must be paid.

NOTE:

- As for the steering wheel installation procedure, refer to the SR section of the service manual.



JBE00253-05091

(9) Replace the wire harness if it exhibits any fault.

NOTE:

- The wiring harness for the air bag can be identified by its external color of yellow.

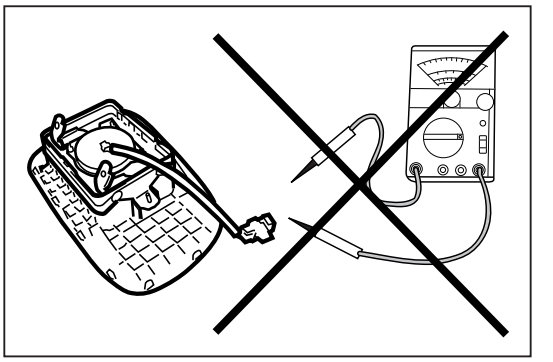
JBE0254-05092

When diagnosis code 31 is indicated:

Possible cause for malfunction: Squib of air bag at front passenger seat side has open wire.

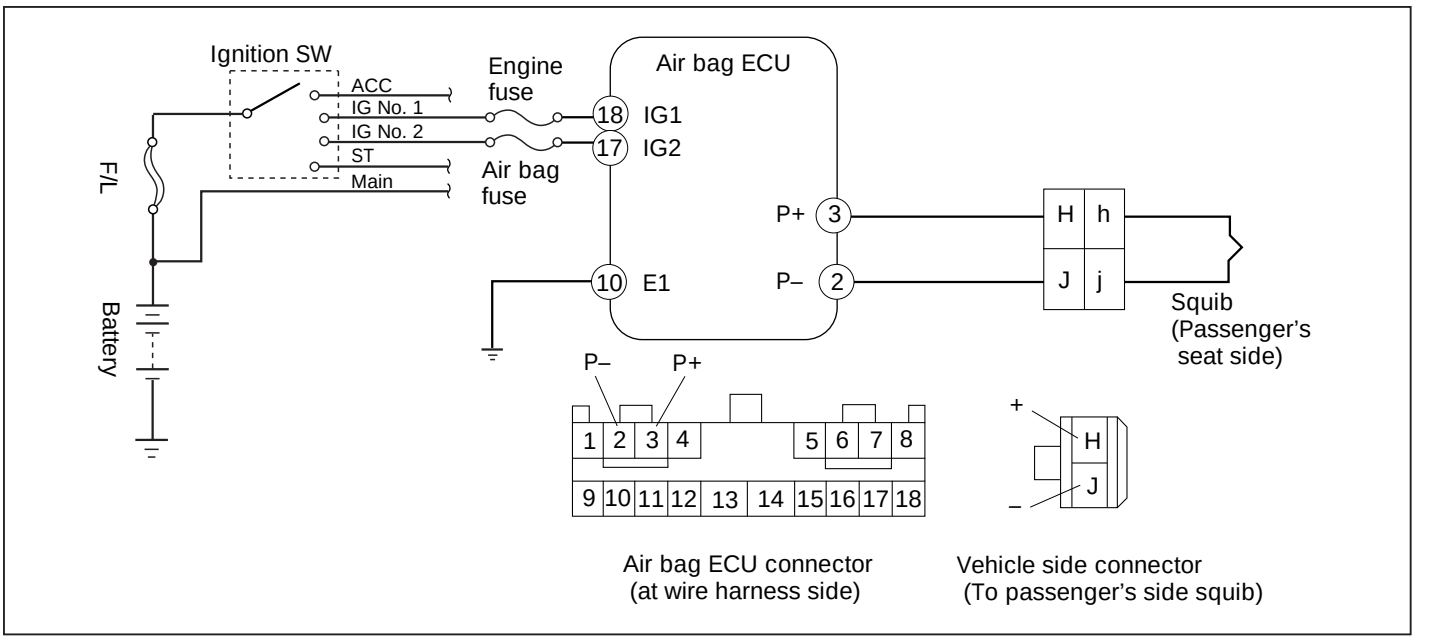
WARNING:

- The squib of the air bag consists of a filament of about 2 ohms. Therefore, there is the possibility that a current which is big enough to cause deployment flows when the circuit tester is connected in its ohmmeter mode.
- Hence, never measure the resistance of the squib easily just because the code 31 is indicated. This may cause the air bag to deploy accidentally, thus causing serious injuries to the operators and other people in the surrounding.



JBE00255-05093

1. Check of wiring harness and connector

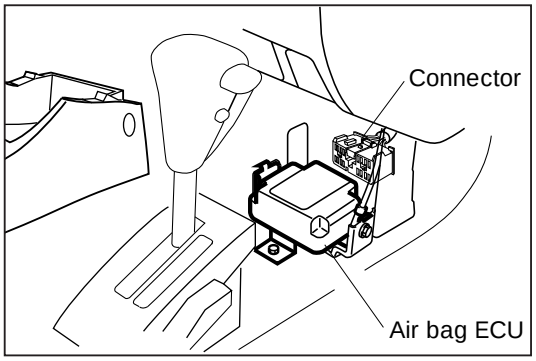


JBE00256-05094

NOTE:
- When there is poor connection between the air bag ECU and the squib, the code 31 is indicated, too.

(1) Turn off the ignition switch and wait for 60 seconds.
(2) Remove the console box. Disconnect the connector at the vehicle wire harness side from the air bag ECU.

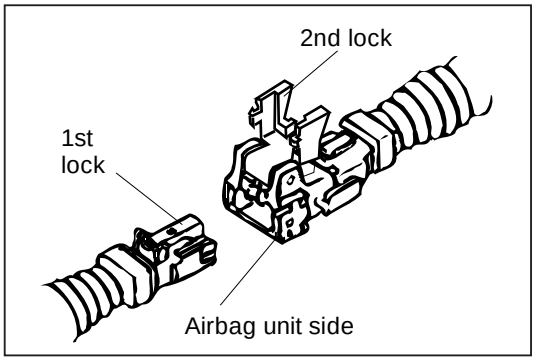
NOTE:
- When the connector is disconnected from the air bag ECU, the connector terminals 2 and 3 are shorted automatically by the short circuit bridge.



JBE00257-05095

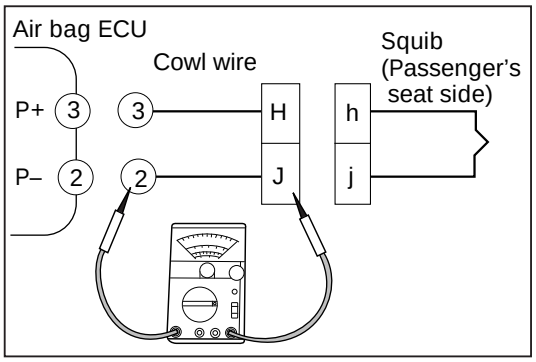
(3) Disconnect the connector which connects the wire harness of the air bag unit and the wire cowl.

NOTE:
- When the connector is disconnected from the air bag unit, the connector terminals (h) and (j) are shorted automatically by the short circuit bridge.



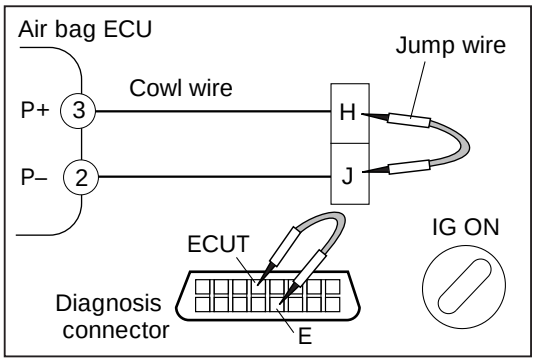
JBE00258-05096

(4) Connect the circuit tester to the connector terminal at the wire cowl side with the tester set to the ohmmeter range. Ensure that there is no open wire in the wire harness.
Between terminal 3 (P+) and H (+):
Continuity exists.
Between terminal 2 (P–) and J (–):
Continuity exists.



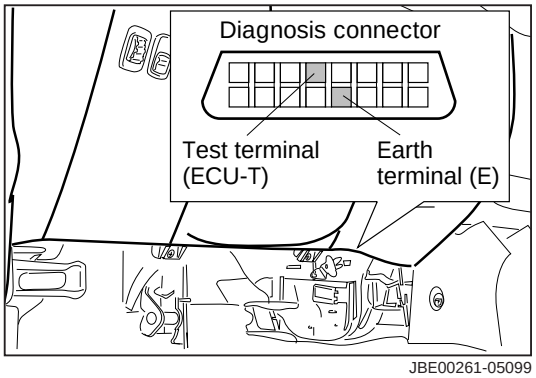
JBE00259-05097

(5) If there is no open wire, connect both ends of the connector terminal with a jump wire to short them.
(6) Connect the connector at the vehicle wire harness side and the air bag ECU connector that were disconnected at Step (2).
(7) Turn on the ignition switch and take a reading of the diagnosis code.



JBE00260-05098

CAUTION:
- If the code 32 (short circuit of squib circuit) is indicated, it proves indirectly that there is open wire in the squib of the air bag unit in the front passenger seat side. Therefore, replace the air bag unit.
- After the replacement, cancel the diagnosis code and confirm that the code 31 is not outputted any more.



JBE00261-05099

2. Confirmation of open wire of squib
   CAUTION:
   - To check an electric circuit for open wire, it is an accepted practice to perform measurement with an ohmmeter. However, it is dangerous to use this method to check the squib for open wire, because this method may cause an accidental explosion. In the preceding step, it has been confirmed that there is no open wire in the circuits other than the squib. Before you proceed to the disposal procedure for the air bag unit described later, it is necessary to prove directly that there is open wire in the squib. As for this procedure, refer to page BE–83.

JBE00262-05100

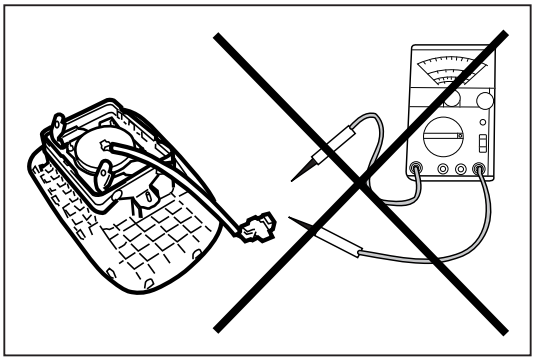
When diagnosis code 32 is indicated:

Possible cause for malfunction: Circuit of squib of air bag at front passenger seat side is shorted.

NOTE:
- The squib of the air bag consists of a filament of about 2 ohms. In order to detect open wire or short circuit in the squib circuit, a small amount of current is flown at all times from the air bag ECU. Therefore, when this code is indicated, it means that an abnormally large amount of current flowed in the squib circuit of the air bag in the driver's seat for a certain reason. Therefore, the ECU judges that the resistor of the squib (filament or wire harness) is shorted.

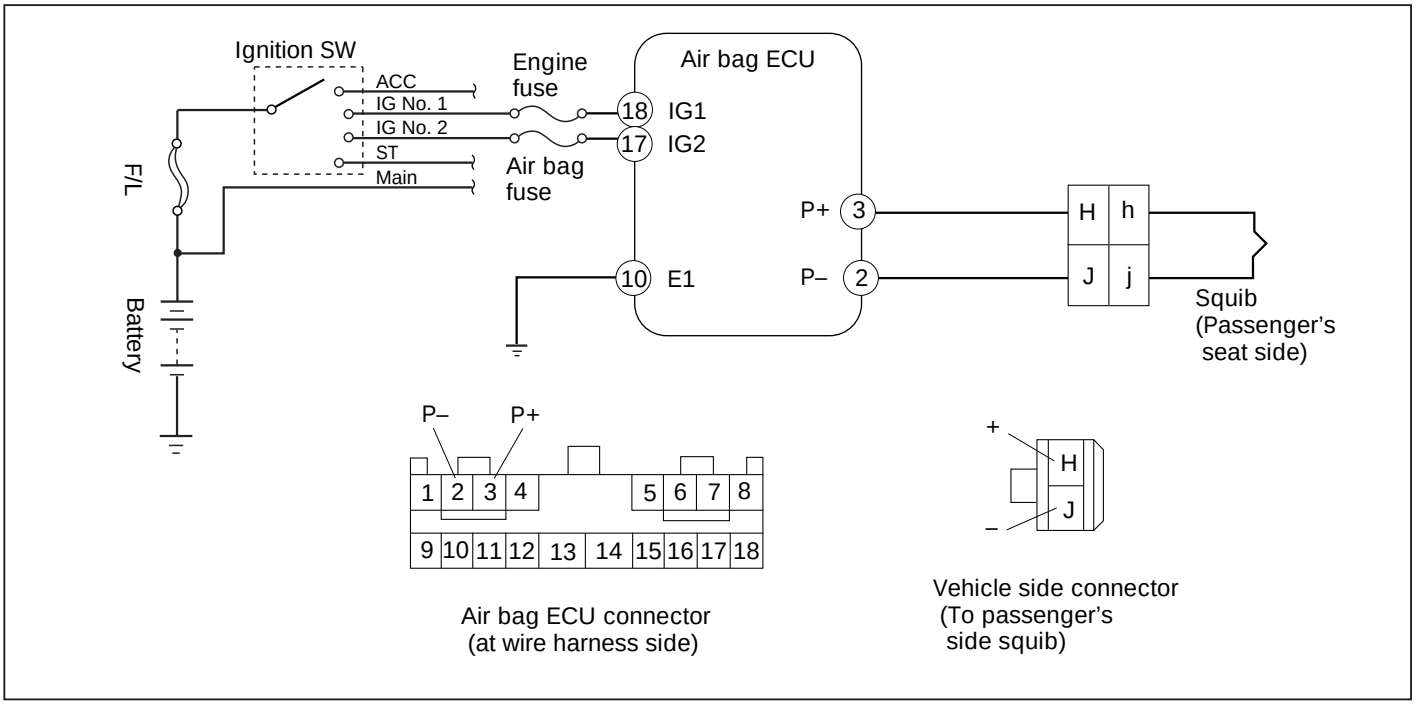
JBE00263-05101

WARNING:
- Never measure directly the resistance of the squib to see if the squib is shorted or not, using a circuit tester. Failure to observe this warning may cause the air bag to deploy accidentally, thus causing injuries to the operators and other people in the surrounding.



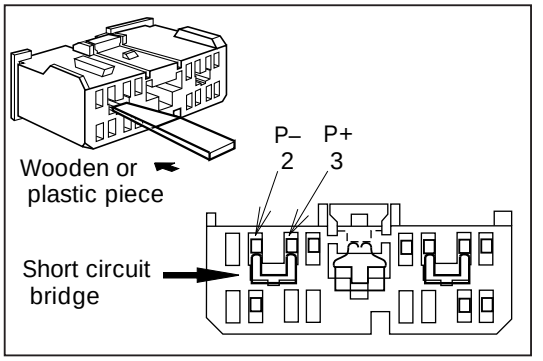
JBE00264-05102

1. Check of wiring harness



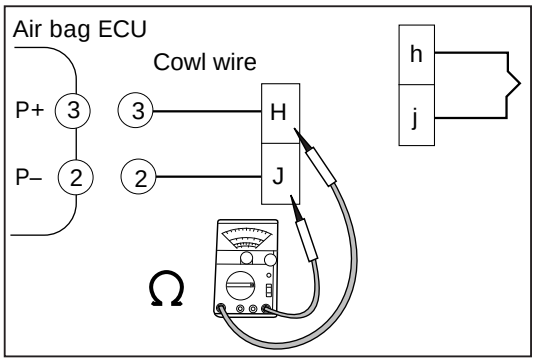
JBE00265-05103

(1) Turn off the ignition switch and wait for about 60 seconds.
(2) Remove the console panel. Disconnect the coupling of the connector of the air bag ECU and the connector at the vehicle wire harness side.
(3) Using a wooden or plastic piece, raise the short circuit bridge at the sections 2 and 3 of the connector at the vehicle wire harness side which were removed from the ECU. In this way, disconnect the shorted contact points.



JBE00266-05104

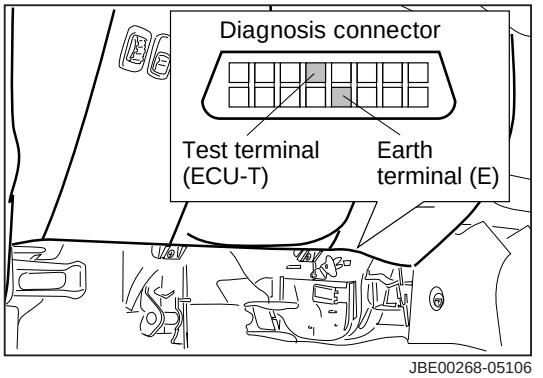
(4) Disconnect the connector which connects the wire harness of the air bag unit and the wire cowl.
(5) Connect the circuit tester to the connector terminal at the wire cowl side with the tester set to the ohmmeter range. Ensure that there is no short in the wire harness.
(6) If there is no short, disconnect the circuit tester. Connect the air bag ECU connector and the connector at the vehicle wire harness side as connected before.



JBE00267-05105

(7) Turn on the ignition switch and take a reading of the diagnosis code.

NOTE:
- If the code 31 (open wire of squib circuit) is not indicated, the air bag ECU is likely malfunctioning.
- After the replacement, cancel the diagnosis code and confirm that the code 31 is not outputted any more.



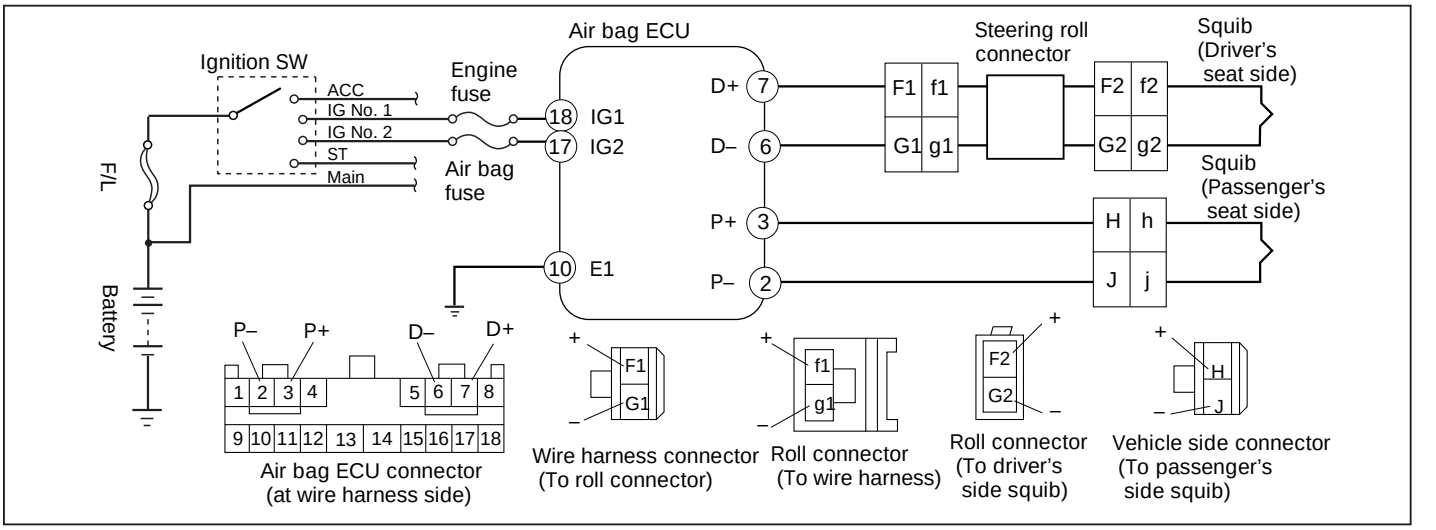
JBE00268-05106

When diagnosis code 41 is indicated:

Possible cause for malfunction: Upstream circuit of squib of air bag at driver's seat side and/or passenger's seat side is grounded to earth.

NOTE:

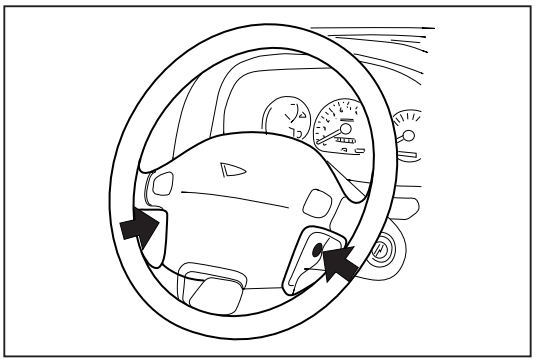
- When this code is indicated, it means that the squib circuit of the air bag is grounded for a certain reason.



JBE00269-05107

1. Check of wiring harness at the driver's seat side
   (1) Turn off the ignition switch and wait for about 60 seconds.
   (2) Remove the steering pad assembly (air bag unit) from the steering wheel.

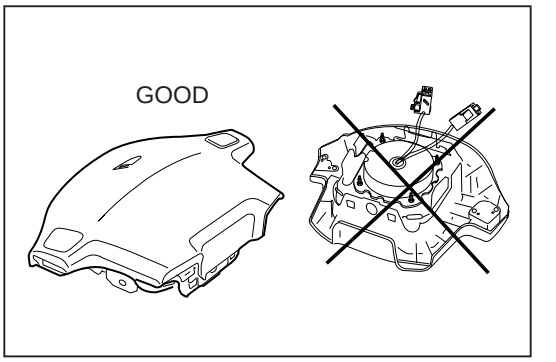
   CAUTION:
   - Any steering pad assembly which was dropped previously can not be used again. Therefore, extreme care must be exercised as to its handling.



JBE00270-05108

   (3) Disconnect the connector of the steering pad assembly from the roll connector. Also disconnect the connector for the horn.

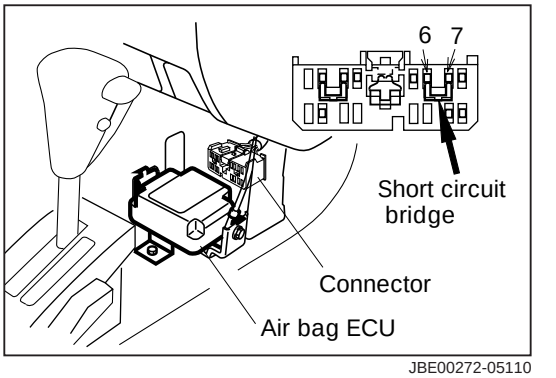
   WARNING:
   - When storing the steering pad assembly (air bag unit), be sure to place it with the pad surface facing upward on a flat place which is not exposed to direct sun rays. Sparks of welding, etc. shall be kept away from the storing place. Also the storing place shall be away from the storing place for oil, grease, etc.



JBE00271-05109

   (4) Disconnect the connector at the vehicle wire harness side from the air bag ECU connector.

   NOTE:
   - When the connector is disconnected from the air bag ECU, the connector terminals 6 and 7 (the squib circuit for the air bag of the driver's seat) are shorted automatically by the short circuit bridge.

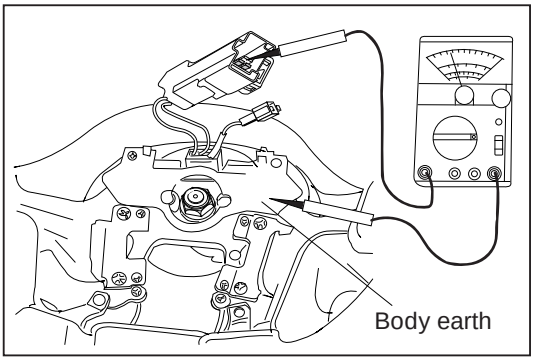


JBE00272-05110

(5) Connect a circuit tester to the roll connector terminal and the body earth with the tester set to the ohmmeter range.

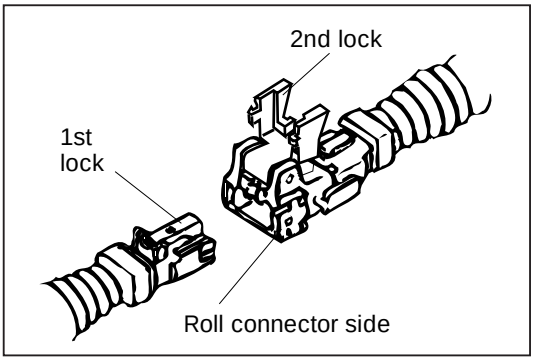
NOTE:

- The wire harness of both terminals of the roll connector is connected at the ECU side connector as was explained before. If there is continuity between the bodies at this item (5), disconnect the connection between both terminals by raising temporarily the short circuit bridge terminal of the ECU side connector with a wooden piece or the like. In this way, determine which terminal has been grounded.



JBE00273-05111

(6) If the wiring harness is shorted with the body earth, it is necessary to know whether the faulty point is attributable to the inside of the roll connector. To this end, disconnect the coupling connector of the roll connector and the wire cowl. Then, perform check with a circuit tester as was described in Item (5) above. If a short circuit is found, replace the faulty part with a new one.



JBE00274-05112

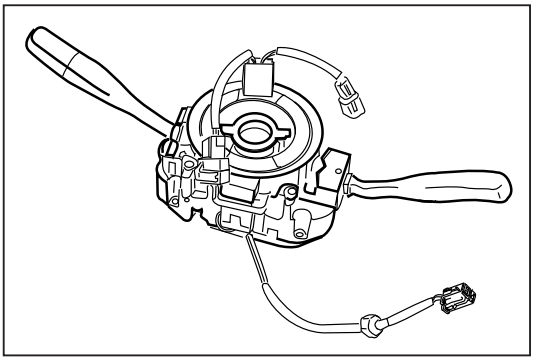
(7) Replacement of roll connector

WARNING:

- When replacing the roll connector, refer to BE–57. Failure to observe this warning may hamper the turning function of the steering wheel or cut the wiring of the roll connector. Therefore, extreme care must be paid.

NOTE:

- As for the steering wheel installation procedure, refer to the SR section of the service manual.

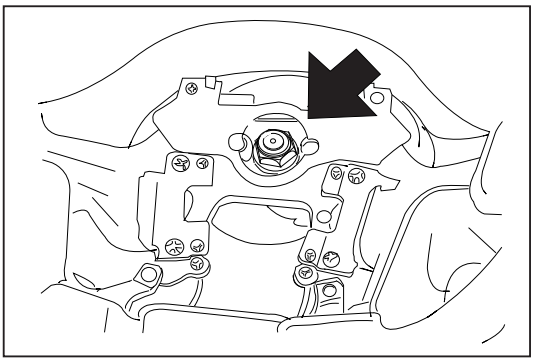


JBE00275-05113

(8) Replace the wiring harness if it exhibits any fault.

NOTE:

- The wiring harness for the air bag can be identified by its external color of yellow.

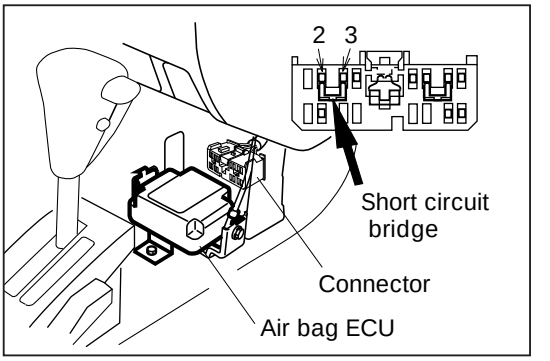


JBE00276-05114

2. Check of wiring harness at the passenger's seat side
   (1) Turn off the ignition switch and wait for about 60 seconds.
   (2) Disconnect the connector at the vehicle wire harness side from the air bag ECU.

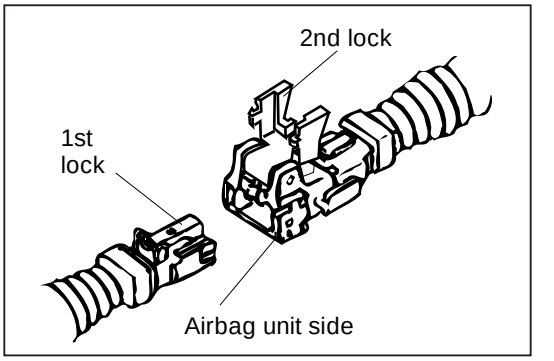
NOTE:

- When the connector is disconnected from the air bag ECU, the connector terminals 2 and 3 (the squib circuit for the air bag in the passenger's seat) are shorted automatically by the short circuit bridge.



JBE00277-05115

(3) Disconnect the connector which connects the wire harness of the air bag unit and the wire cowl.

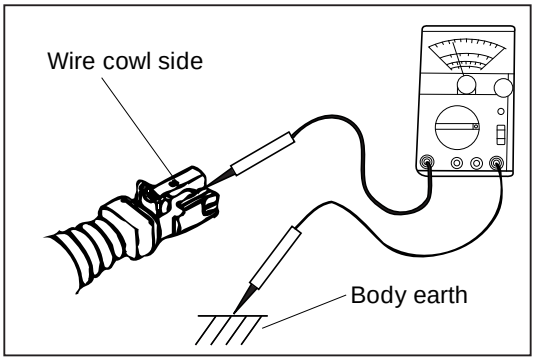


JBE00278-05116

(4) Connect a circuit tester between the connector terminal at the wire cowl side and the body earth with the tester set to the ohmmeter range.

NOTE:

- The wire harness of both terminals of the connector is connected at the ECU side connector as was explained before. If there is continuity between the bodies at this item (4), disconnect the connection between both terminals by raising temporarily the short circuit bridge terminal of the ECU side connector with a wooden piece or the like. In this way, determine which terminal has been grounded.

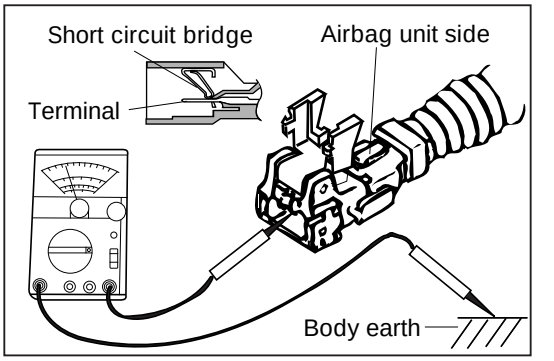


JBE00279-05117

(5) If there is no abnormality in the wire harness in the previous item (4), check to see if the connector terminal at the air bag side is connected with the body earth.

WARNING:

- Both terminals of the connector at the air bag side are connected with the short circuit bridge. Therefore, the tester probe terminal should be connected in such a way that this bridge may not be disconnected. If this short circuit bridge is disconnected and the tester voltage is applied to the terminals, the air bag may be deployed accidentally.



JBE00280-05118

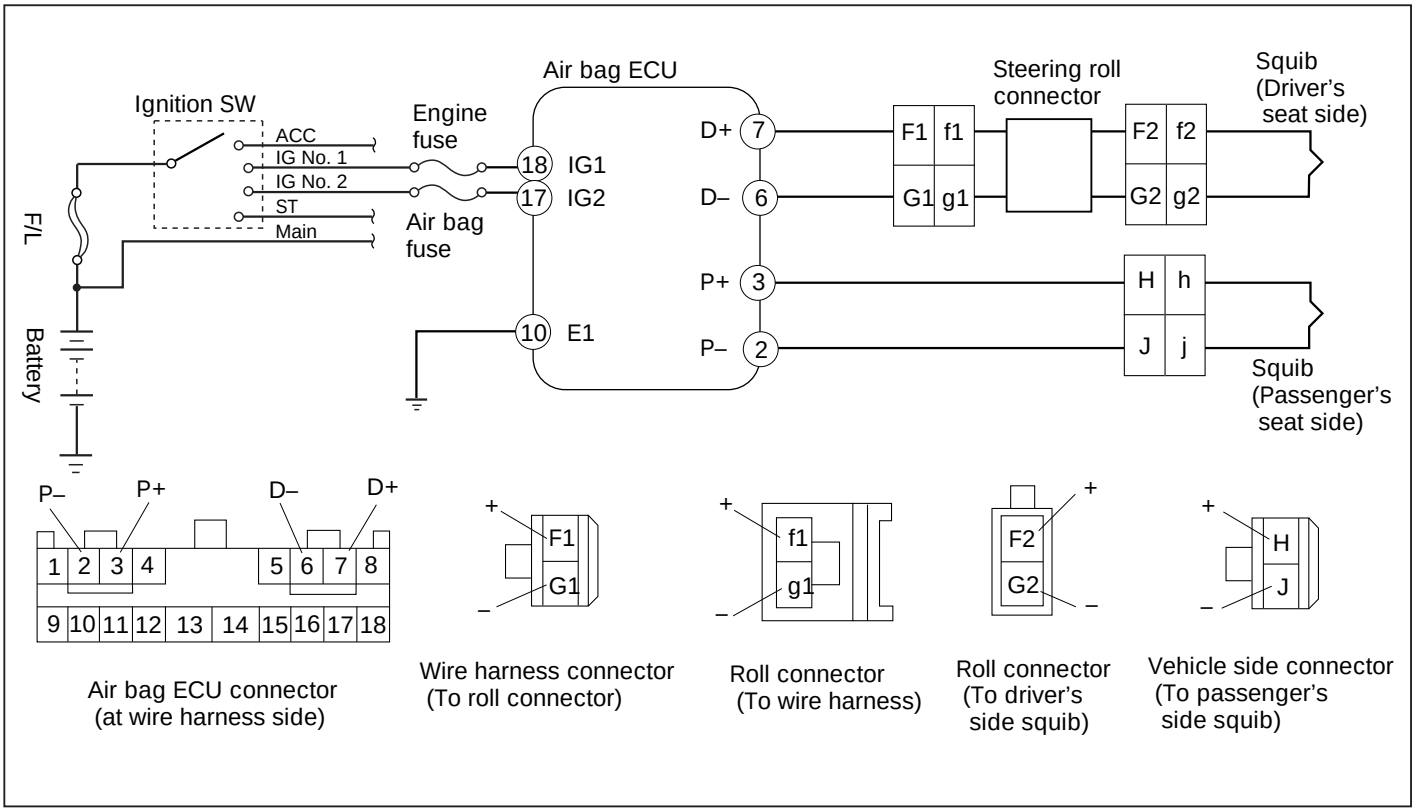
When diagnosis code 42 is indicated:

Possible cause for malfunction: Power supply voltage is applied to upstream circuit of squib of air bag at driver's seat side and/or passenger's seat side.

WARNING:

- When this code is indicated, it indicates that the upstream ignition driver is turned on for a certain reason. Under this condition, the air bag is deployed as soon as the safing sensor at the downstream circuit is turned on. Hence, when this code is indicated, immediately turn off the ignition key switch and proceed to the following steps.

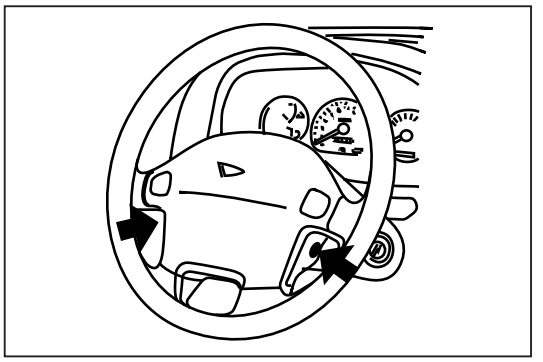
JBE00281-05119



JBE00000-05120

1. Checking procedure of air bag at the driver's seat side
   (1) Turn off the ignition switch and wait for about 60 seconds.
   (2) Remove the steering pad assembly (air bag unit) from the steering wheel.

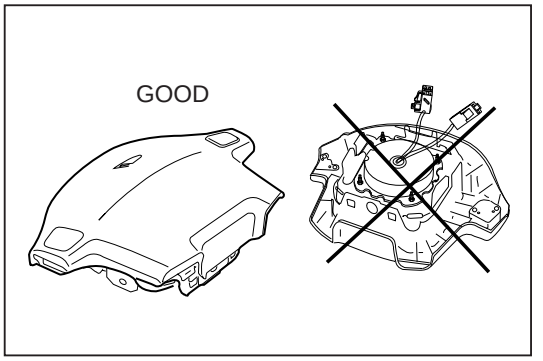
   CAUTION:
   - The steering pad assembly is installed to the steering wheel by means of TORX® bolts.
   - A steering pad assembly which was dropped previously can not be used again. Therefore, extreme care must be exercised as to its handling.



JBE00282-05121

   (3) Disconnect the connector of the steering pad assembly from the roll connector. Also disconnect the connector for the horn.

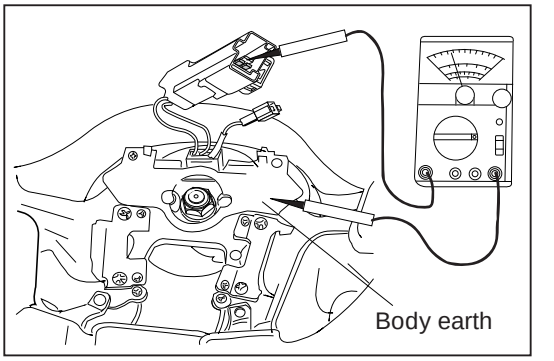
   WARNING:
   - When storing the steering pad assembly, be sure to place it with the pad surface facing upward on a flat place which is not exposed to direct sun rays. Sparks of welding, etc. shall be kept away from the storing place. Also the storing place shall be away from the storing place for oil, grease, etc.



JBE00283-05122

(4) With a circuit tester set to the voltmeter mode, connect the roll connector terminal and the body earth.
(5) Turn on the ignition switch. Check if the voltmeter registers approximately the battery voltage.
NOTE:
• Measure the voltage of each connector terminal.

(6) Replacement of air bag ECU
NOTE:
• As for this procedure, refer to item 3, “Replacement of air bag ECU.”

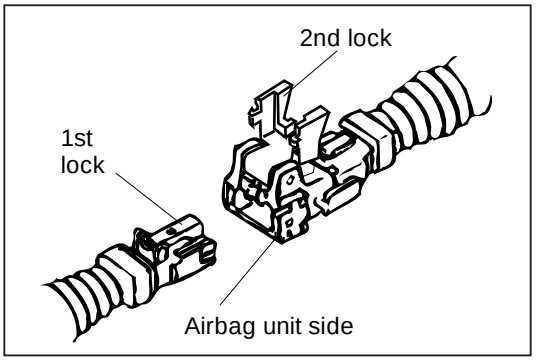


JBE00284-05123

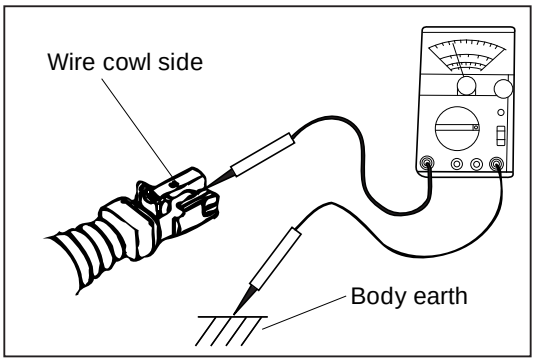
2. Checking procedure of air bag at the passenger’s seat side
(1) Turn off the ignition switch and wait for about 60 seconds.
(2) Disconnect the connector which connects the wire harness of the air bag unit and the wire cowl.

(3) Connect a circuit tester between the connector terminal at the wire cowl side and the body earth with the circuit tester set to the voltmeter mode.
(4) Turn on the ignition switch. Check if the voltmeter registers the battery voltage.
NOTE:
• Measure the voltage of each connector terminal.

(5) Replacement of air bag ECU
NOTE:
• As for this procedure, refer to item 3, “Replacement of air bag ECU.”



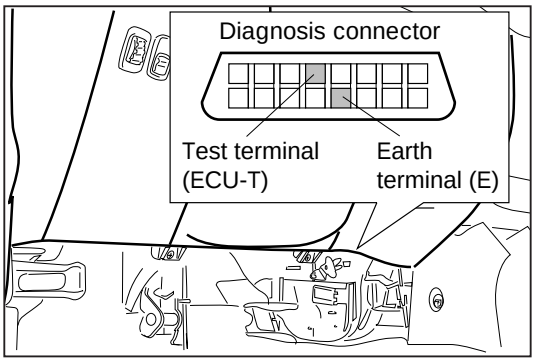
JBE00285-05124



JBE00286-05125

3. Replacement of air bag ECU
NOTE:
• The code 42 is indicated when the vehicle was subjected to a light impact which was not big enough to cause the air bag to deploy and, therefore, the upstream ignition circuit functioned temporarily. In such case, the ECU resumes the normal operation later. Hence, the ECU can be used again by canceling the code according to the diagnosis code canceling method. When the output of this code is attributable to causes other than the malfunctioning ECU, no voltage has been applied to the circuit during the check of the preceding item 1.(4), (5) or item 2.(3), (4).

(1) If the battery voltage is applied to the terminal during the check of the preceding item 1.(4), (5) or item 2.(3), (4), the ECU is regarded as malfunctioning. (The ECU can not resume its normal operation regardless of causes.) It is necessary to replace the air bag ECU.
(2) As for the replacing procedure of air bag ECU, refer to page BE–61.



JBE00287-05126

JBE00288-05127

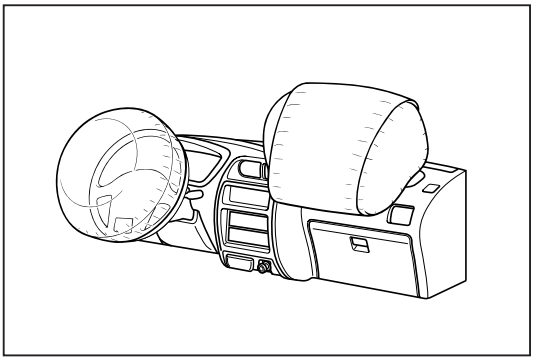
When diagnosis code 61 is indicated:

NOTE:

- This code is outputted when the air bag system were operated. This diagnosis code can not be canceled and the air bag ECU can not be used again. It is necessary to replace them.

WARNING:

- Refer to the disposal procedure for the air bag at “DISPOSAL PROCEDURE FOR AIR BAG.”



JBE00289-05128

When diagnosis code 62 is indicated:

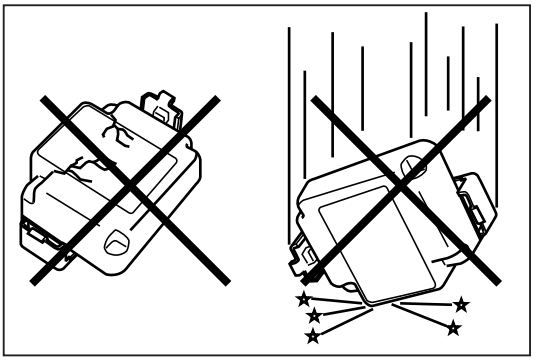
Possible cause for malfunction: Malfunction of ECU

NOTE:

- This code indicates that the ECU is malfunctioning. This diagnosis code can not be canceled. Therefore, the air bag ECU can not be used again. It is necessary to replace the air bag ECU.

CAUTION:

- The G sensor is built in the air bag ECU. If the ECU is dropped once, the reliability of CPU and G sensor can not be assured. Therefore, the air bag ECU can not be used again. Extreme care must be exercised as to its handling.



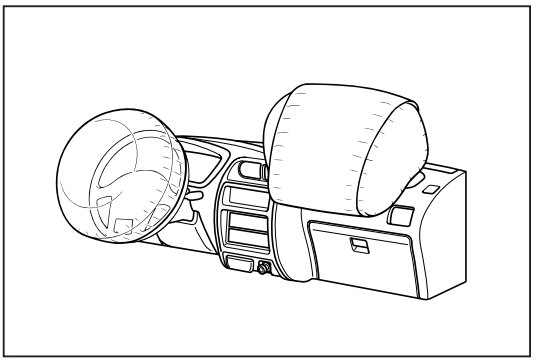
JBE00290-05129

DISPOSAL PROCEDURE FOR AIR BAG

Disposal of vehicles with air bag system

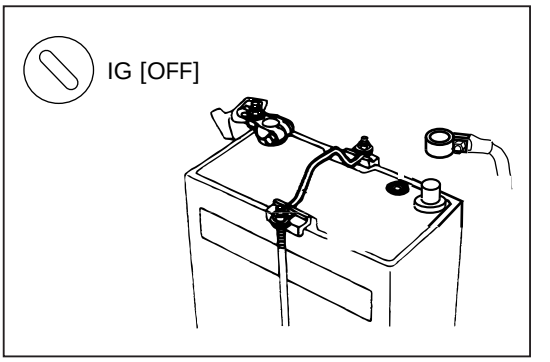
WARNING:

- When disposing the vehicles with the air bag system, deploy the air bag while it is mounted on the vehicle.



JBE00291-05130

1. Disposal procedure for air bag in driver’s seat
   (1) Turn off the ignition switch. Wait for 60 seconds.
   (2) Prepare a 12-V battery for automotive use.



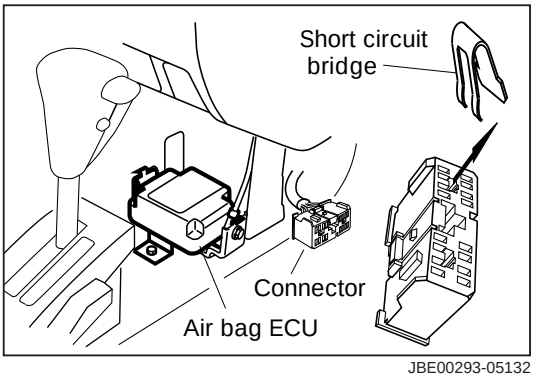
JBE00292-05131

   (3) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU.
   (4) Using a pincette or a screwdriver having a slim end, remove the short circuit bride at the terminals 6 and 7 of the disconnected connector.
   (5) Prepare two wires for automotive use, each of which measures more than six meters long.

WARNING:

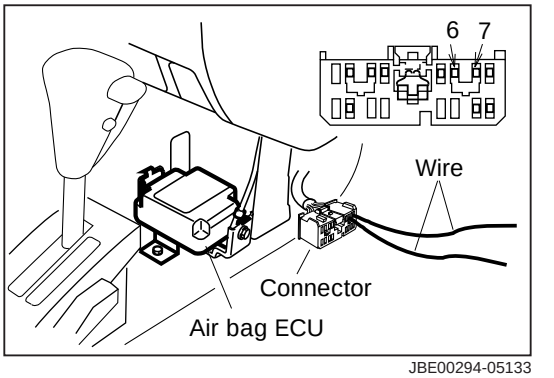
- Connect the end of one wire with the end of the other wire so that they may be shorted.

   (6) Connect the wires prepared in Step (5) above to the connector terminals 6 and 7.



JBE00293-05132

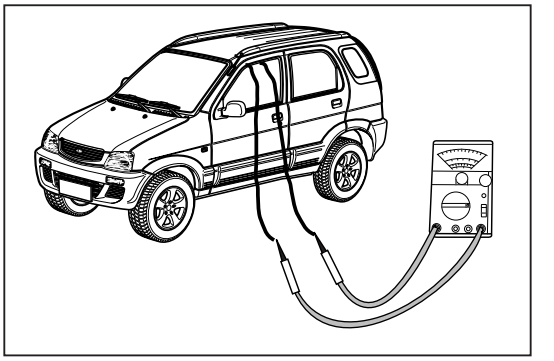
WARNING:
- This connecting operation to the connector should be performed by one person, not by a joint work of plural operators, so as to avoid mistakes.
- During this operation, there is the possibility that the air bag may be deployed accidentally. Therefore, be sure to give a warning to other persons so that they may get out of the vehicle or may be kept away from the area five meters from the vehicle.



JBE00294-05133

(7) The shorted section of the wires should be kept five meters or more away from the vehicle, as shown in the figure.

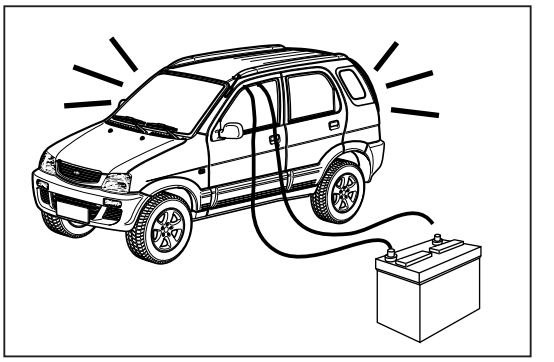
CAUTION:
- Be sure to give a warning to other persons about a big noise that will be emitted at the time of the air bag deployment.
- The window glass should be closed in advance.


JBE00295-05134

NOTE:
- Concerning the description of open wire of the squib–page BE–71 and BE–76, be sure to temporarily measure a resistance wires as right figure.

(8) Disconnect the wires that have been shorted. Connect one wire to the positive terminal of the battery; the other wire to the negative terminal of the battery, thereby deploying the air bag.

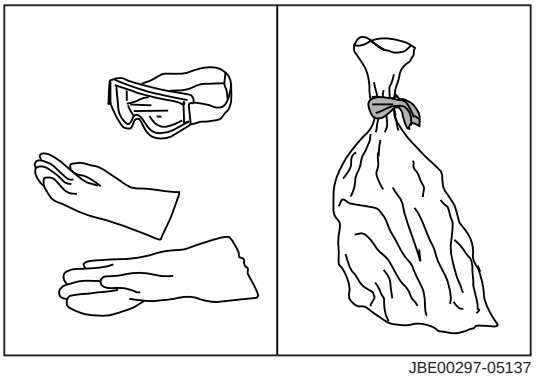
NOTE:
- There is no need for identifying the polarity of the battery.


JBE00296-05135

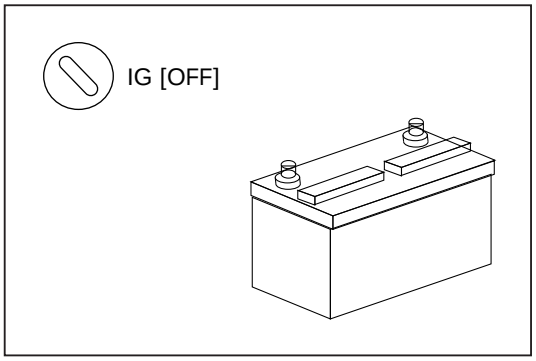
WARNING:
- Immediately after the deployment of the air bag, the vehicle interior is filled with gas. Therefore, start the operation after gas is diffused.
- Since the metal section of the gas generator is extremely hot, leave it at least for thirty minutes to allow it to cool naturally.

(9) After the deployed air bag cools down completely, it shall be sealed in a bag to be disposed.

WARNING:
- Be sure to wear protective goggles and gloves during this operation. After completion of the operation, gargle and wash your hands. If you feel any abnormality in your respiratory organs, follow the instruction of a doctor.

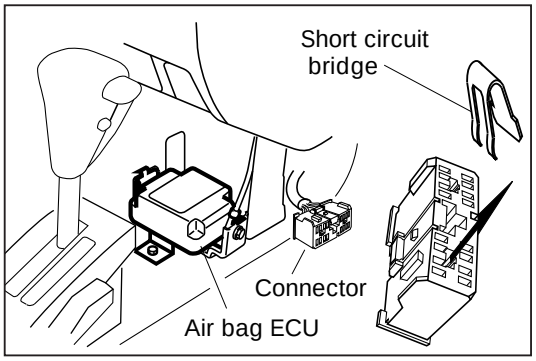

JBE00297-05137

2. Disposal procedure of air bag at front passenger seat
   (1) Turn off the ignition switch. Wait for 60 seconds.
   (2) Prepare a 12-V battery for automotive use.



JBE00298-05138

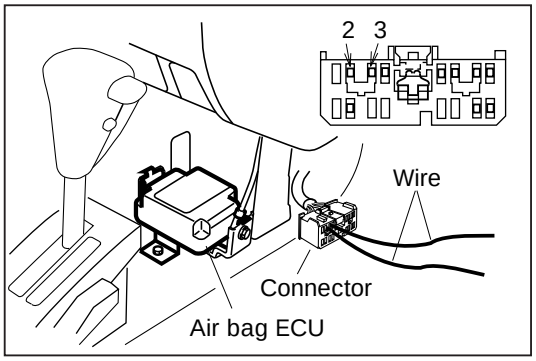
   (3) Remove the console panel. Disconnect the connector at the vehicle wire harness side from the air bag ECU connector.
   (4) Using a pincette or a screwdriver having a slim end, remove the short circuit bride at the terminals 2 and 3 of the disconnected connector.
   (5) Prepare two wires for automotive use, each of which measures more than six meters long. Connect the end of one wire with the end of the other wire so that they may be shorted.



JBE00299-05139

   (6) Connect the wires prepared in Step (5) above to the connector terminals 2 and 3.

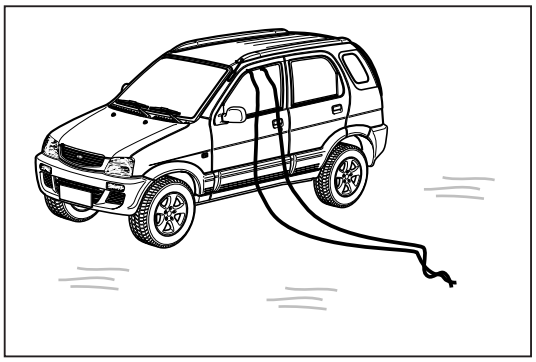
WARNING:
- This connecting operation to the connector should be performed by one person, not by a joint work of plural operators, so as to avoid mistakes.
- During this operation, there is the possibility that the air bag may be deployed accidentally. Therefore, be sure to give a warning to other persons so that they may get out of the vehicle or may be kept away from the area five meters from the vehicle.



JBE00300-05140

   (7) The shorted section of the wires should be kept five meters or more away from the vehicle, as shown in the figure.

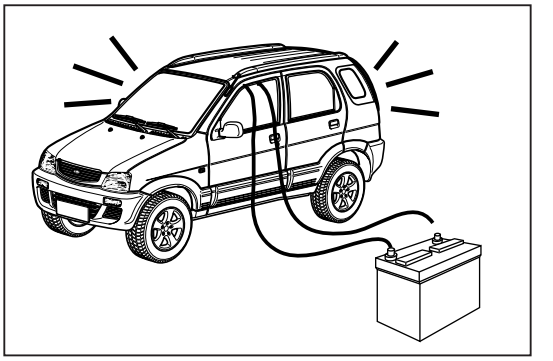
CAUTION:
- Be sure to give a warning to other persons about a big noise that will be emitted at the time of the air bag deployment.
- The window glass should be closed in advance.



JBE00301-05141

(8) Disconnect the wires that have been shorted. Connect one wire to the positive terminal of the battery; the other wire to the negative terminal of the battery, thereby deploying the air bag.

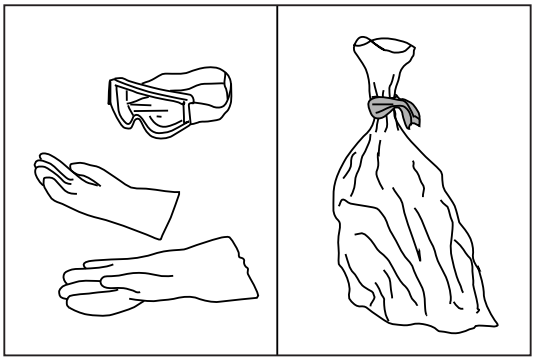
NOTE:
- There is no need for identifying the polarity of the battery.


JBE00302-05142

WARNING:
- Immediately after the deployment of the air bag, the vehicle interior is filled with gas. Therefore, start the operation after gas is diffused.
- Since the metal section of the gas generator is extremely hot, leave it at least for thirty minutes to allow it to cool naturally.

(9) After the deployed air bag cools down completely, it shall be sealed in a bag to be disposed.

WARNING:
- Be sure to wear protective goggles and gloves during this operation. After completion of the operation, gargle and wash your hands. If you feel any abnormality in your respiratory organs, follow the instruction of a doctor.


JBE00303-05144

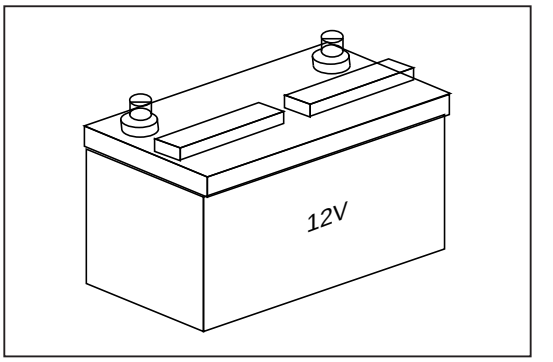
Disposal of air bag unit

CAUTION:
- It is the best to dispose the air bag when they are installed in the vehicle. However, if it is unavoidable to perform the pre-treatment for disposal for the unit itself, follow the procedure given below.

JBE00304-05145

NOTE:
- Items to be prepared

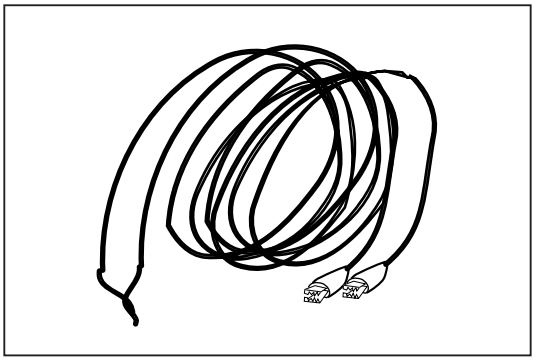
(1) 12-V battery for automotive use



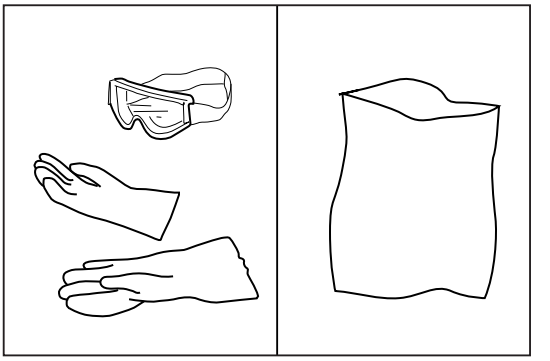
JBE00305-05146

(2) Two wires for automotive use, each measuring at least 10 meters long
An alligator clip is connected to each end of these wires.

WARNING:
- Connect the end of one wire with the end of the other wire so that they may be shorted.
- No switch shall be installed to these wires so as to prevent accidents.


JBE00306-05147

(3) Protective goggles and gloves
(4) A bag for disposal

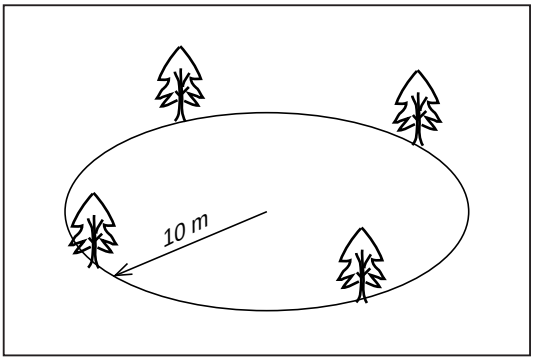


JBE00307-05148

(5) A spacious place whose radius is at least 10 meters

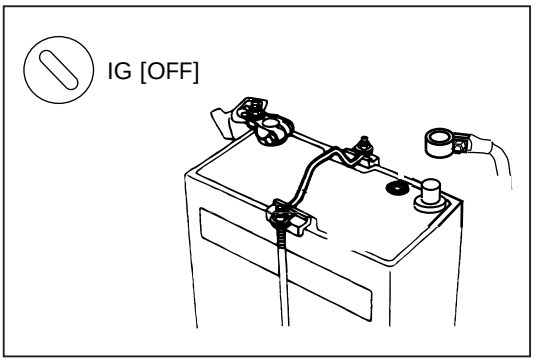
CAUTION:

- Do not perform the pre-treatment for disposal for the air bag on a windy or rainy day.



JBE00308-05149

1. Disposal procedure for air bag in driver's seat (steering wheel pad)
   (1) Turn off the ignition switch. Disconnect the negative terminal of the battery from the vehicle cable terminal.

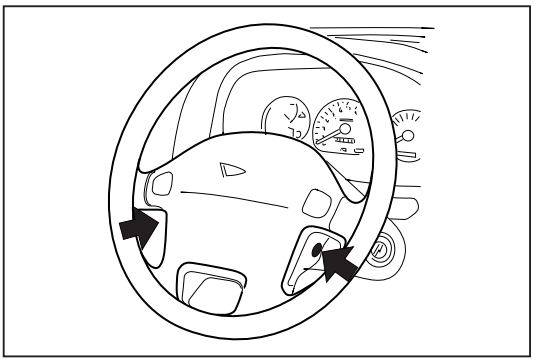


JBE00309-05150

   (2) Turn off the ignition switch and wait at least for 60 seconds. Remove the steering wheel pad assembly from the steering wheel.

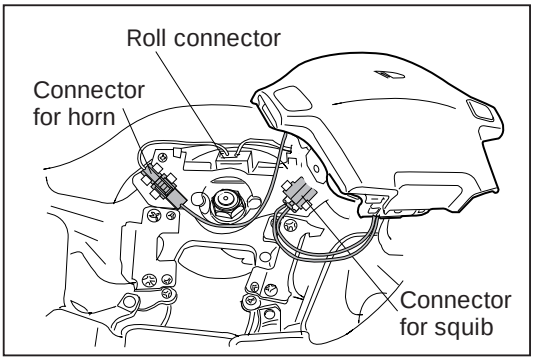
NOTE:

- The steering wheel pad assembly is installed to the steering wheel by means of TORX® bolts.



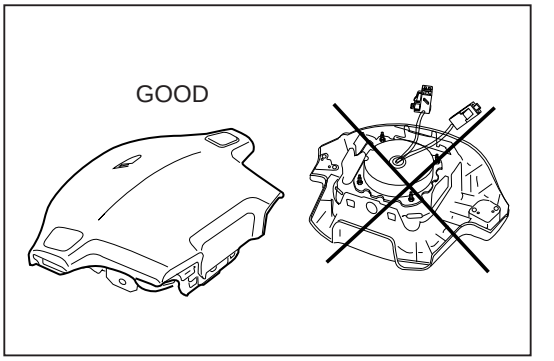
JBE00310-05151

   (3) Disconnect the connector of the steering wheel pad assembly from the roll connector. Disconnect the connector for horn.



JBE00311-05152

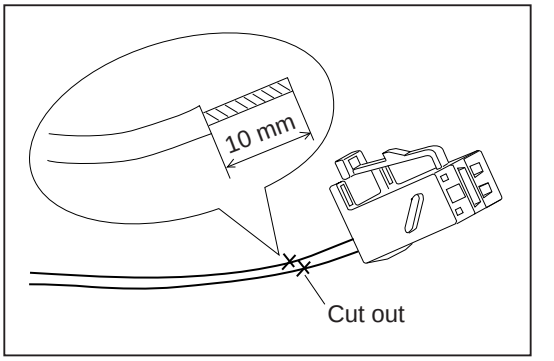
WARNING:
- When storing the steering pad assembly temporarily, be sure to place it with the pad surface facing upward on a flat place which is not exposed to direct sun rays. Also the storing place shall be away from water and rain.



JBE00312-05153

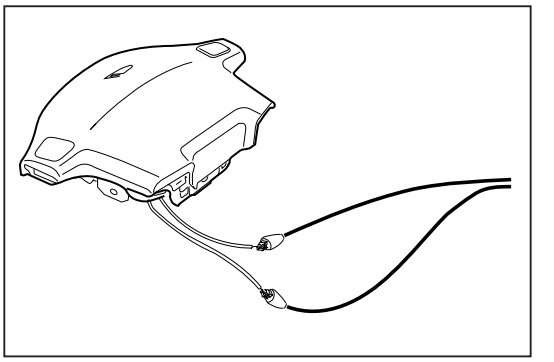
(4) Cut the wires at the squib connector of the steering pad assembly. Remove the covering of each end of the two cut wires about 10 mm.

WARNING:
- Connect the sections each other whose wire coverings have been removed so that they may be shorted.



JBE00313-05154

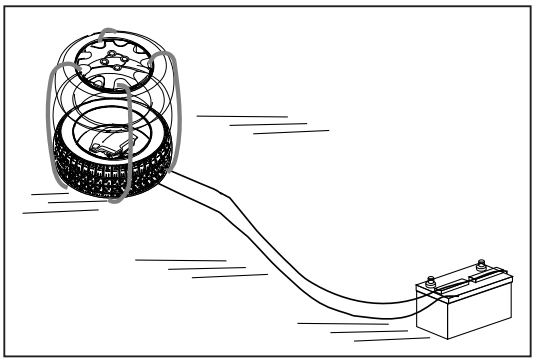
(5) Place the steering pad assembly at the center of the prepared place. At this time, the pad surface should face upward.
(6) Disconnect the shorted squib wires of the steering pad assembly. Connect the alligator clip attached to the end of the prepared 10m-long wire to each squib wire.



JBE00314-05155

(7) Place the prepared 12-V battery for automotive use at a corner of the place. Bring nearby the shorted ends of the wires which is extended from the steering pad assembly.

WARNING:
- Be sure to give a warning to other persons about a big noise that will be emitted at the time of the air bag deployment.



JBE00315-05156

(8) Disconnect the wire ends that have been shorted. Connect one wire to the positive terminal of the battery; the other wire to the negative terminal of the battery, thereby deploying the air bag.

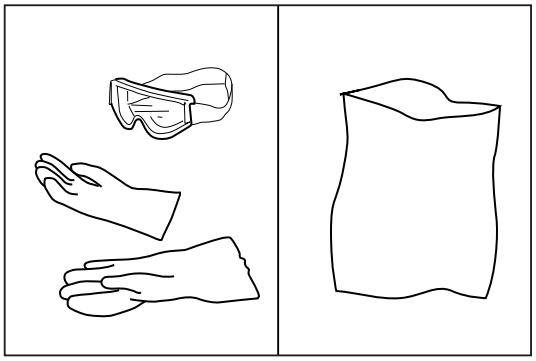
NOTE:
- There is no need for identifying the polarity of the battery.

JBE00316-05157

(9) Since the metal section of the gas generator is extremely hot, leave it at least for thirty minutes to allow it to cool naturally. After the deployed air bag cools down completely, it shall be sealed in a bag to be disposed.

WARNING:

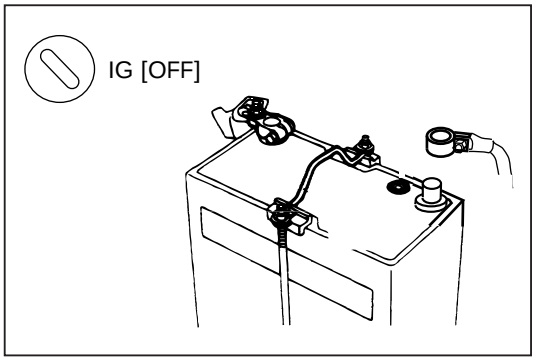
- Be sure to wear protective goggles and gloves during this operation. After completion of the operation, gargle and wash your hands. If you feel any abnormality in your respiratory organs, follow the instruction of a doctor.



JBE00317-05158

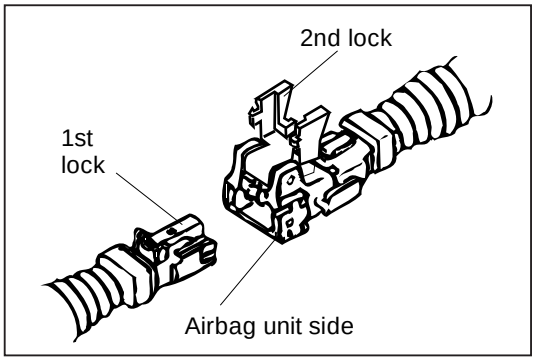
2. Disposal procedure of air bag in front passenger seat

(1) Turn off the ignition switch. Disconnect the vehicle battery cable terminal from the negative terminal of the battery.



JBE00318-05159

(2) Turn off the ignition switch and wait for 60 seconds. Disconnect the connector which connects the wire harness of the air bag unit and the wire cowl.

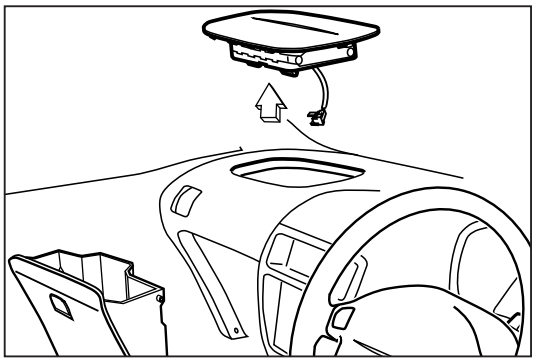


JBE00319-05160

(3) Remove the air bag unit assembly in the front passenger seat.

NOTE:

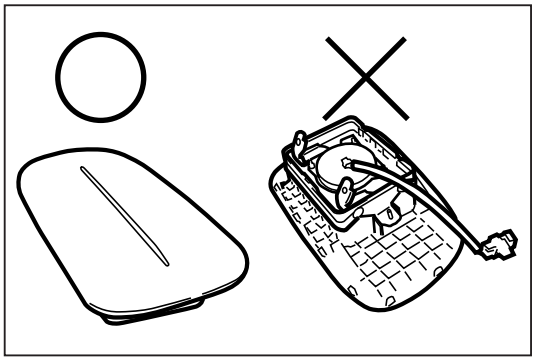
- Before removing the air bag unit assembly in the front passenger seat, remove the instrument panel. As for this procedure, refer to the section BO.



JBE00320-05161

WARNING:

- When storing the air bag unit assembly in the front passenger seat temporarily, be sure to place it with the pad surface facing upward on a flat place which is not exposed to direct sun rays. Also the storing place shall be away from water and rain.

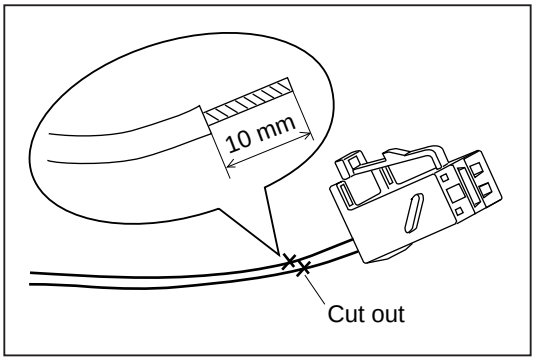


JBE00321-05162

(4) Cut the wires at the squib connector of the air bag unit assembly. Remove the covering of the ends of the two cut wires about 10 mm.

WARNING:

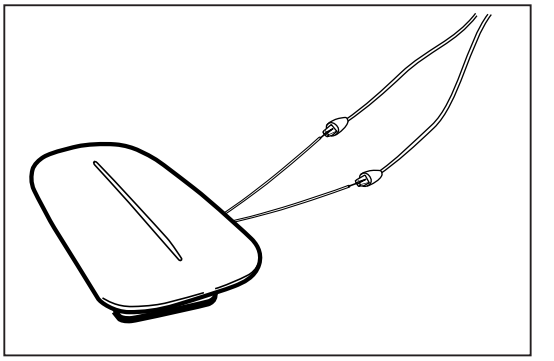
- Connect the sections each other whose wire coverings have been removed so that they may be shorted.



JBE00322-05163

(5) Place the air bag unit assembly at the center of the prepared place. At this time, the pad surface should face upward.

(6) Disconnect the shorted squib wires of the air bag unit assembly. Connect the alligator clip attached to the end of the prepared 10m-long wire to each squib wire.

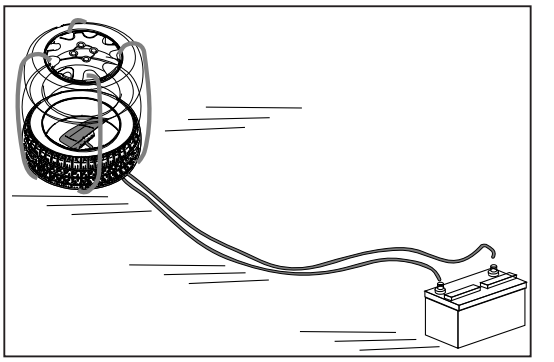


JBE00323-05164

(7) Place the prepared 12-V battery for automotive use at a corner of the place. Bring nearby the shorted ends of the wires which is extended from the air bag unit assembly.

WARNING:

- The pad assembly should be secured by piled up tires, as shown in the figure.
- Be sure to give a warning to other persons about a big noise that will be emitted at the time of the air bag deployment.



JBE00324-05165

(8) Disconnect the wire ends that have been shorted. Connect one wire to the positive terminal of the battery; the other wire to the negative terminal of the battery, thereby deploying the air bag.

NOTE:

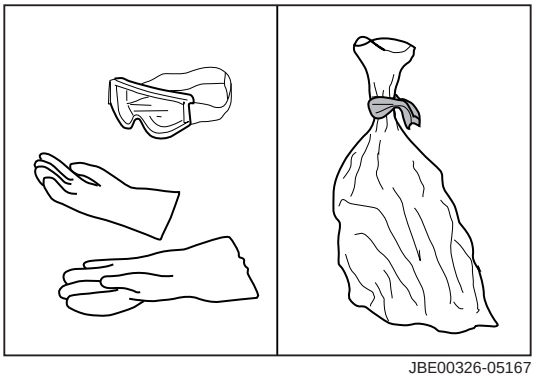
- There is no need for identifying the polarity of the battery.

JBE00325-05166

(9) Since the metal section of the gas generator is extremely hot, leave it at least for thirty minutes to allow it to cool naturally. After the deployed air bag cools down completely, it shall be sealed in a bag to be disposed.

WARNING:

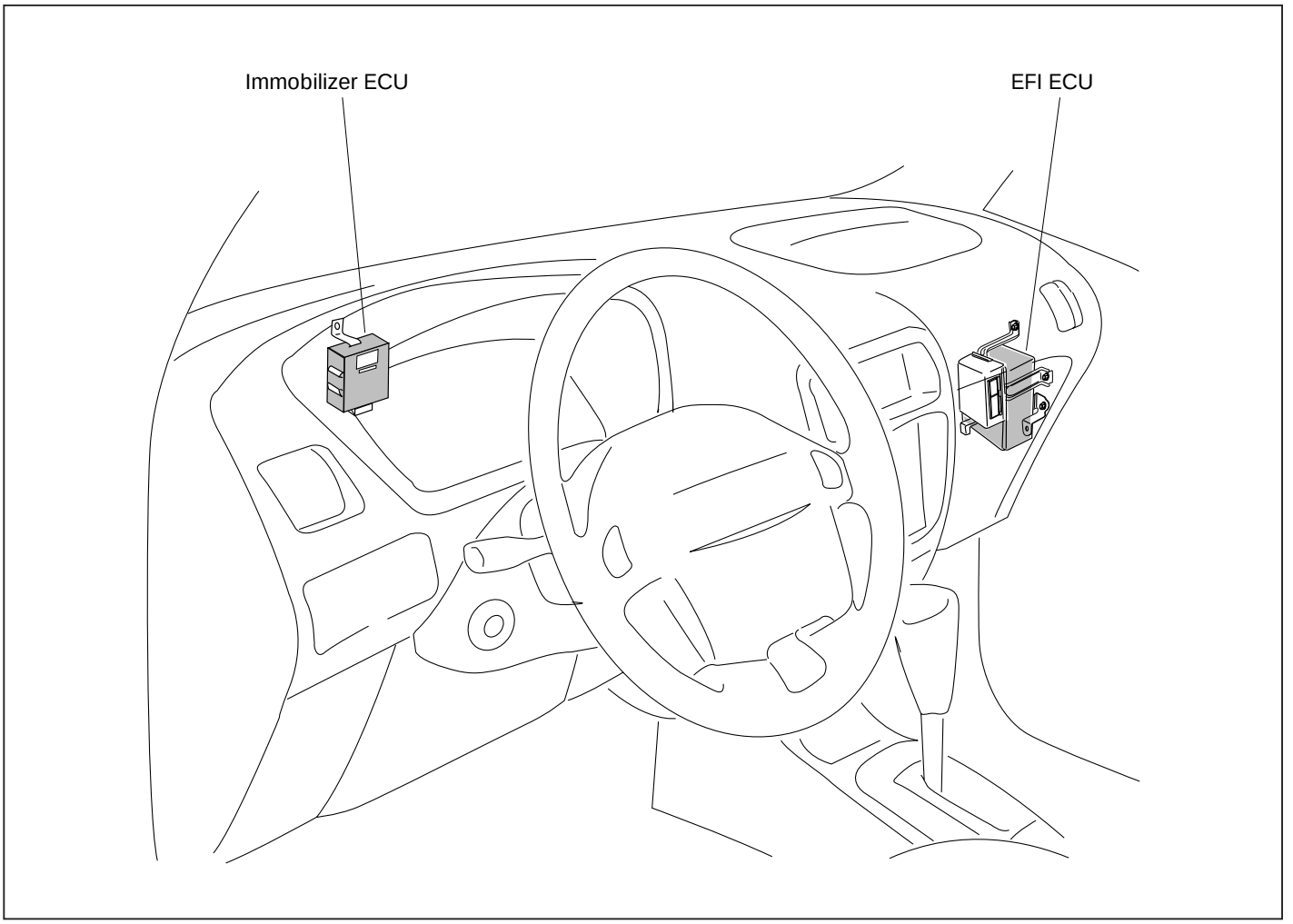
- Be sure to wear protective goggles and gloves during this operation. After completion of the operation, gargle and wash your hands. If you feel any abnormality in your respiratory organs, follow the instruction of a doctor.



JBE00326-05167

IMMOBILIZER SYSTEM

COMPONENTS LAYOUT



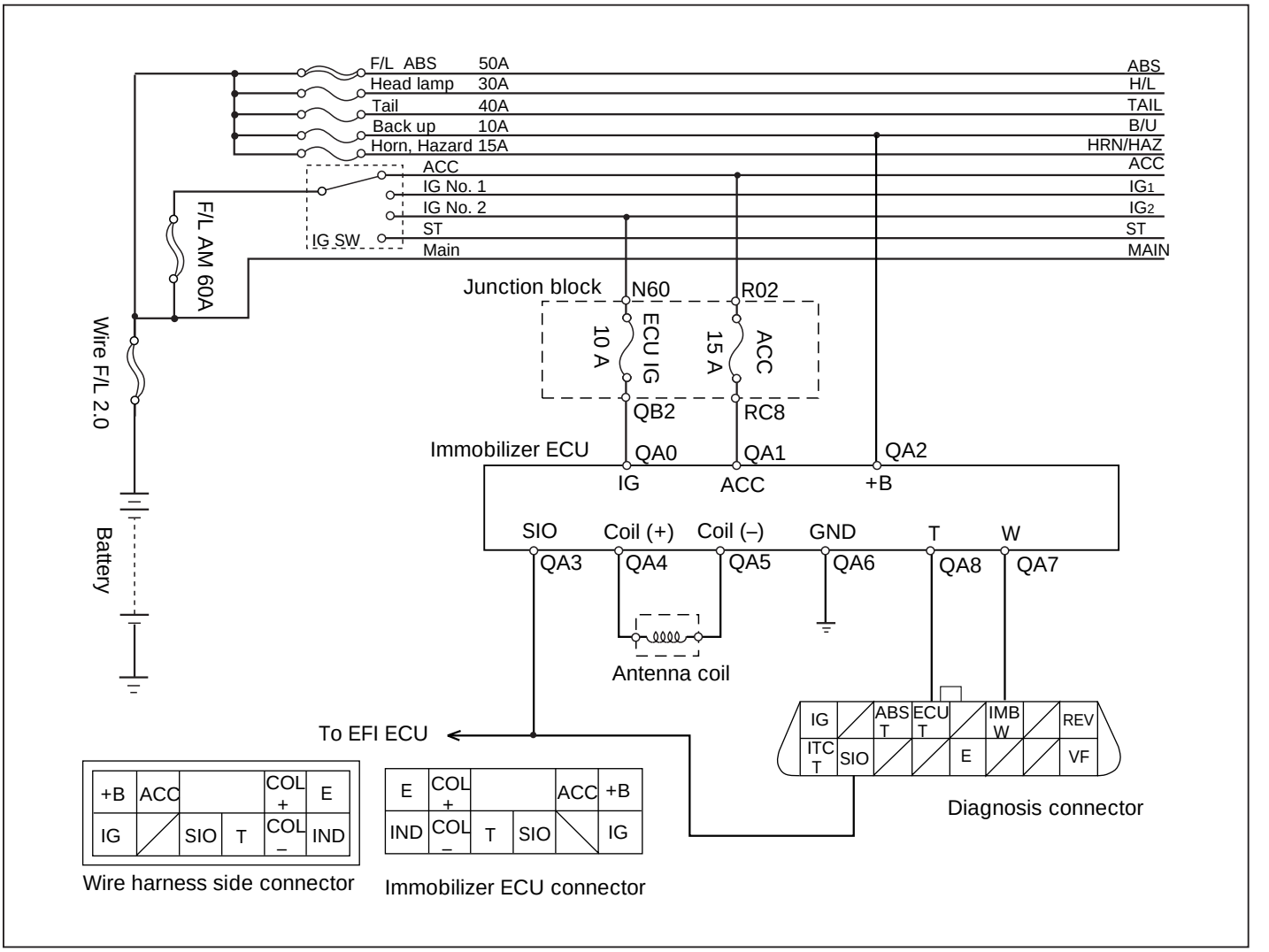
JBE00327-06001

OUTLINE

This system consists of a transponder-built-in key, an antenna coil, an immobilizer ECU and EFI ECU.
In the immobilizer system for EFI gasoline engine, if the key ID code can not be collated or the rolling code is not matched with each other, the EFI ECU stops the ignition and fuel injection, thereby stopping the engine operation. The key ID code is a transponder intrinsic code, whereas the rolling code takes a different value every time the engine is started. This code is renewed and memorized in the EFI ECU and immobilizer ECU as the rolling code for the next starting.

JBE00328-06002

WIRING DIAGRAM



JBE00329-06003

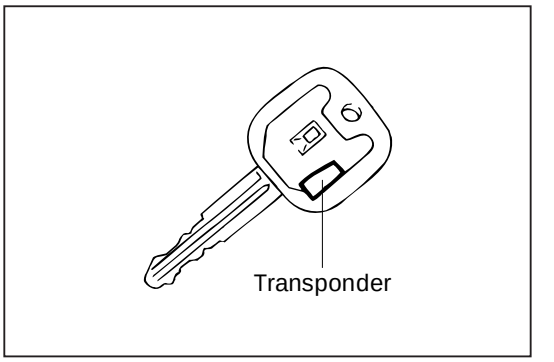
COMPONENTS

1. Ignition key

The vehicle with the immobilizer system is provided with three ignition keys; one black-covered **master key** and two gray-covered **sub keys**. The transponder is built in the cover of each of the three keys. Each key has a different recorded ID code.

In this system, the operation/releasing of the system can be performed by comparing and collating the ID code with the data memorized in the immobilizer ECU.

Although two sub keys are provided for the vehicle, up to three keys can be registered, as required, by means of the sub key registration function of the master key.



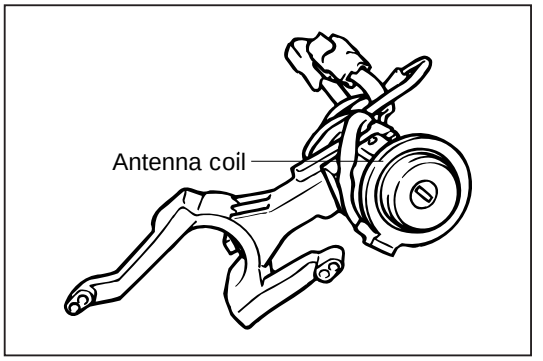
JBE00330-06004

CAUTION:
- The master key has the following functions. Utmost care must be paid as to its handling.
  a. Using the master key (black cover), it is possible to perform the new registration and renewal of the sub keys.
  b. The black covered key is memorized as the master key at the time of factory shipment. However, if the immobilizer ECU memory has been cleared at time of repairs, etc., the key used first to start the engine will be registered as the master key in the immobilizer ECU.
     This point should be kept in mind.

JBE00331-06005

2. Antenna coil

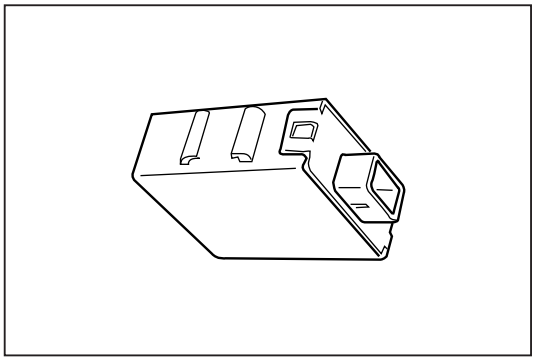
The antenna coil is provided at the circumference of the ignition key cylinder. The antenna coil energizes the transponder built in the ignition key. Also, the antenna coil receives the ID code that is sent from the transponder and will send it to the immobilizer ECU.
If any metal shielding, such as a key holder ring, exists between the ignition key and the antenna coil, or if there is open wire in the antenna coil or its circuit, it becomes impossible to read the ID code of the ignition key, thus being unable to start the engine.



JBE00332-06006

3. Immobilizer ECU

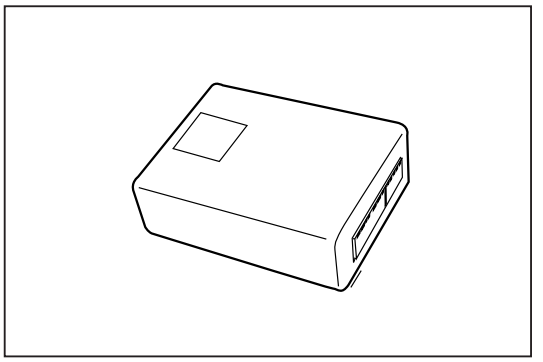
The immobilizer ECU collates the ID code sent from the key transponder with the ID code recorded in the immobilizer ECU. Only when the ID codes are matched with each other, the immobilizer ECU sends the signal of continuation of engine operation to the EFI ECU.
In order to memorize the ID code, the immobilizer ECU employs a non-volatile ROM that retains the memorized data even when the battery or backup fuse is disconnected.
Therefore, when you erase the ECU memory and register the master key ID code newly, you have to erase the memory, using the diagnosis system (DS-21).



JBE00333-06007

4. EFI ECU

In addition to the hitherto-employed functions as the conventional engine control unit, the EFI ECU has the functions as the immobilizer function whereby the ignition and fuel injection are stopped if the ID codes can not be collated in the immobilizer ECU or in instances where the rolling codes can not be collated between the immobilizer ECU and the EFI ECU.



JBE00334-06008

TROUBLE-SHOOTING

TROUBLE-SHOOTING HINTS

Before checking the immobilizer system, check the diagnosis code of the EFI system to determine whether the malfunction is caused by the immobilizer system or by the EFI system.

CAUTION:
- In the immobilizer system, the system is composed with the same rolling code shared in common among the ignition key, immobilizer ECU and EFI ECU. Hence, if the immobilizer ECU and/or EFI ECU are replaced with that of another vehicle during the checking of the immobilizer ECU or EFI system, the immobilizer system will be regarded as malfunctioning. Therefore, do not replace the immobilizer ECU and/or EFI ECU with that of another vehicle unnecessarily.
- If you have to replace the immobilizer ECU and/or EFI ECU, erase the rolling codes memorized in the immobilizer ECU and EFI ECU. Then, register the ID code of the ignition key to the immobilizer ECU.
- Refer to service manual, Ref. No.9031.

DESCRIPTION

A self-diagnosis system is built in the ECU. If any abnormality should occur in the immobilizer system, the self- diagnosis system memorizes the malfunction phenomenon in the ECU in the form of malfunction code number.
When the test terminal of the check connector is connected with the ground terminal, the malfunction code number that has been memorized in the ECU will be indicated in a form of blinking of the check lamp in the SST.
This memorized malfunction code number is erased when the battery ground cable is disconnected from the negative (–) terminal of the battery or when the backup fuse in the relay block assembly is disconnected with the ignition key switch turned off.

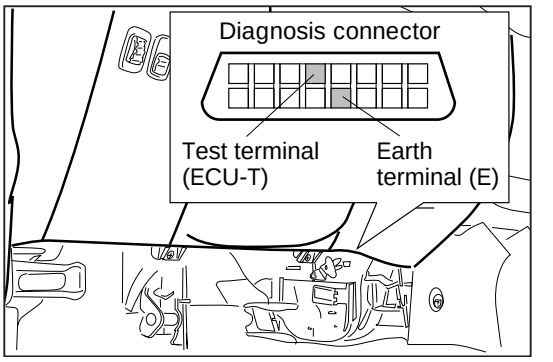
JBE00335-06009

READ OUT OF DIAGNOSIS CODE

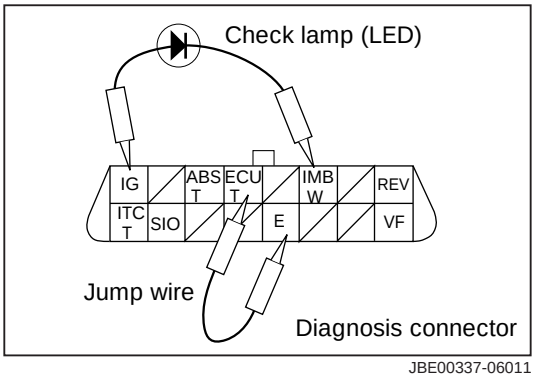
1. Connect the test terminal of the check connector with the ground terminal, using a jump wire.
2. Connect a check lamp between the terminals as illustration.
   NOTE:
   - Prepare the following SST.
     SST: 09991-87211-000

   CAUTION:
   - As for the check lamp, make sure to use a LED (light emitting diode) type. Bulb type check lamp is not suitable for this system.

3. Set the ignition switch to the ON position.
4. Read the diagnosis code by observing the number of blinking of the indicator lamp.



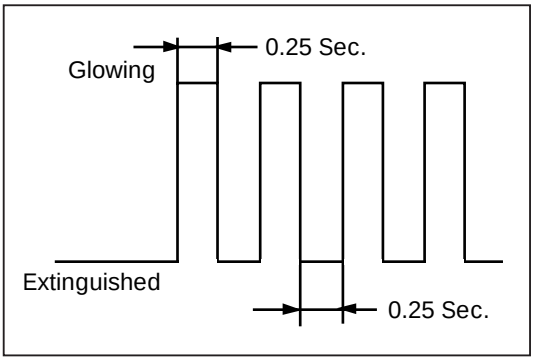
JBE00336-06010



JBE00337-06011

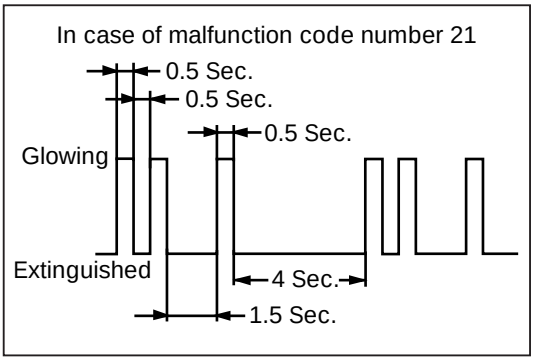
EXPLANATION OF DIAGNOSIS CODE

1. Indication of normal code
   The check lamp glows for 0.25 second, 0.25 second later after the ignition switch has been turned ON. After a lapse of 0.25 second, the check lamp again glows for 0.25 second. Then, this pattern will be repeated.

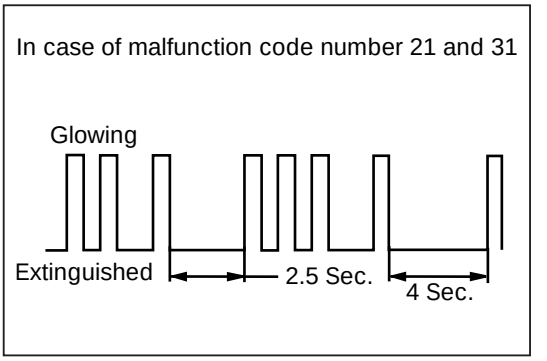


JBE00338-06012

2. Indication of malfunction code
   - When a single malfunction code is indicated:
     The diagnosis malfunction code is composed of two digits. Those two numbers are indicated by blinking of the check lamp. Four seconds later after the ignition switch has been turned on, the check lamp indicates first the number of the tens digit of the diagnosis code by blowing the same times as the number. The lamp glows for 0.5 second each time and then it is extinguished for 0.5 second. After a pause of 1.5 seconds, the check lamp indicates the number of the units digit of the diagnosis code by glowing the same times as the number.
     The lamp glows for 0.5 second each time and then it is extinguished for 0.5 second. Then, this pattern will be repeated after a pause of 4.0 seconds.



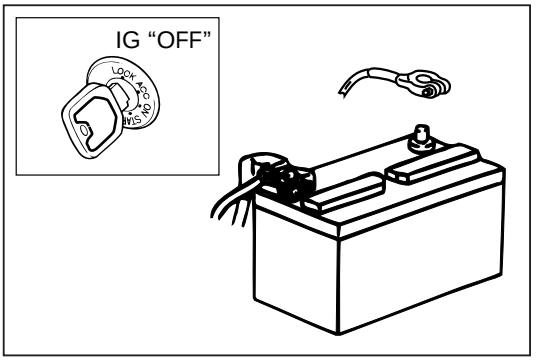
JBE00339-06013



JBE00340-06014

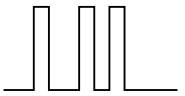
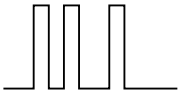
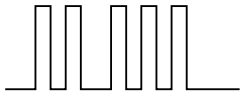
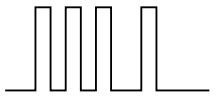
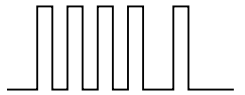
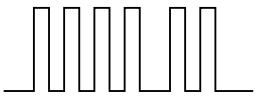
   - When plural malfunction codes are indicated:
     In cases where plural malfunction codes have been detected, the two-digit diagnosis codes are indicated in the sequence of the code number, starting from a smaller number. Each diagnosis code is indicated in above described pattern. A pause of 2.5 seconds occurs between the outputs of respective diagnosis codes, thus separating one from the others. After all of the plural diagnosis codes that have been detected are indicated, the check lamp is extinguished for four seconds. Then, the detected plural diagnosis codes will be indicated again.

3. Canceling of diagnosis code
   To erase the diagnosis codes memorized in the ECU after malfunctions have been repaired, disconnect the battery ground cable from the negative (–) terminal of the battery for at least 10 seconds with the ignition switch turned off.



JBE00341-06016

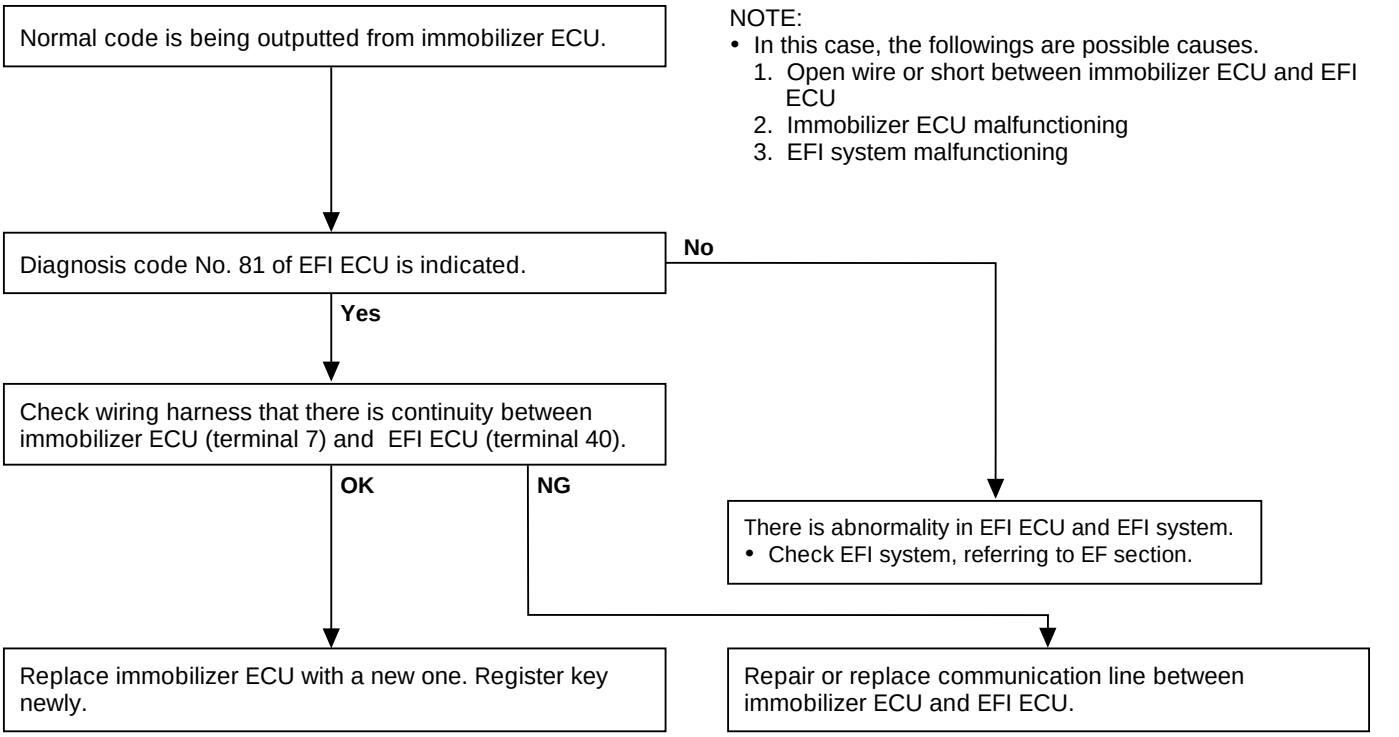
TABLE OF DIAGNOSIS CODES

Code No.	Number of glowing of check lamp	Diagnosis item	Diagnosis contents
12		Malfunction of transponder	When there is no reply from key transponder after the coil has energized key transponder. (This diagnosis code is cleared if ID code can be read normally next time.)
21		Unmatching of ID codes	When immobilizer ECU determines that an attempt was made to start engine, using an unregistered key:
23		Unregistered ID codes	When transponder code to immobilizer ECU is unregistered: (Code to backup RAM is not memorized.)
31		Abnormality of registration mode	At time of registration of sub key, terminal T is not connected to ground, or an attempt is made to make registration, using a sub key. (Code to backup RAM is not memorized.)
41		Faulty communication between immobilizer ECU and EFI ECU • Non-matching of codes	When a signal of non-matching of code is received at time of communication with EFI ECU:
42		Faulty communication between immobilizer ECU and EFI ECU • When there is no reply of code:	When reply of code has not been received within specified time from EFI ECU at time of communication with EFI ECU:

JBE00342-06020

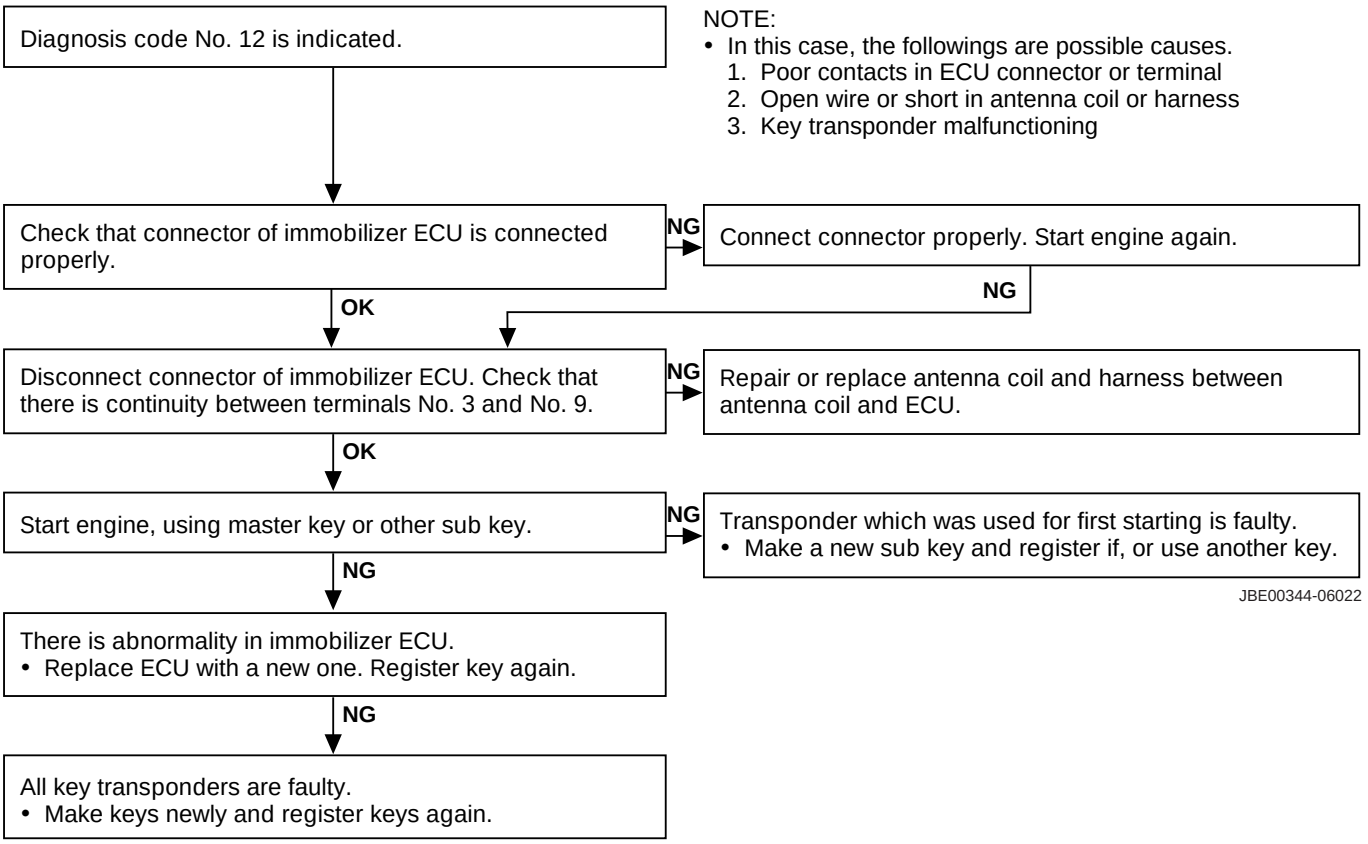
TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

1. Normal code is outputted.



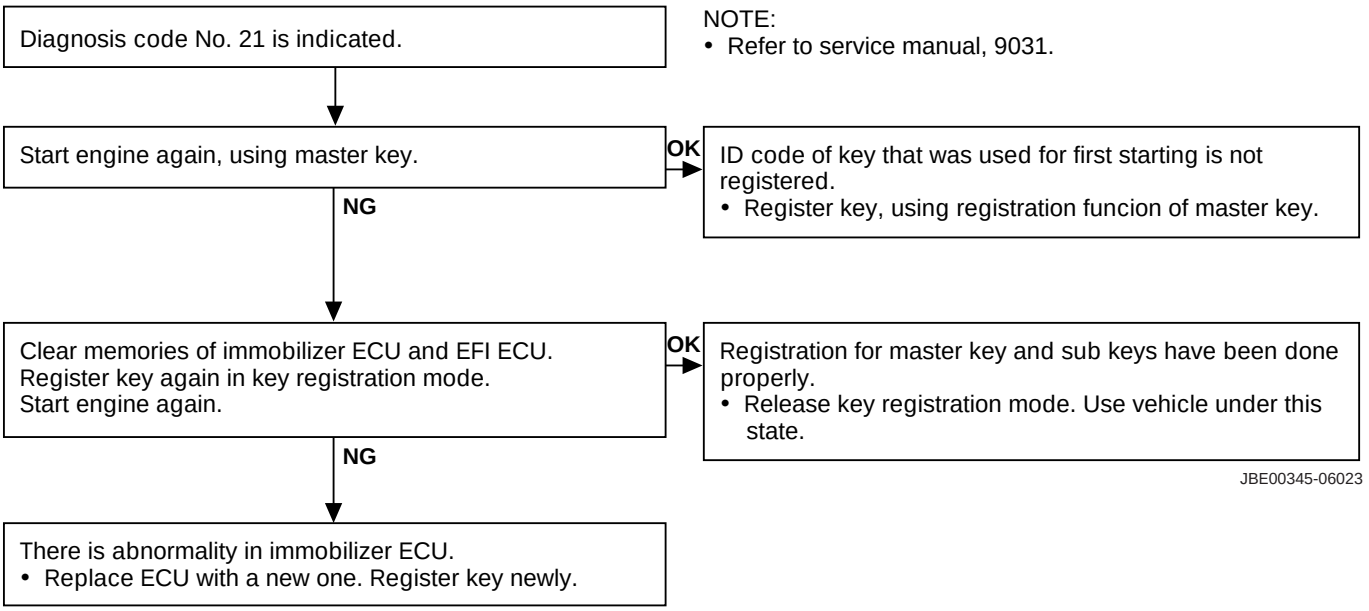
JBE00343-06021

2. Diagnosis code No.12 is indicated.



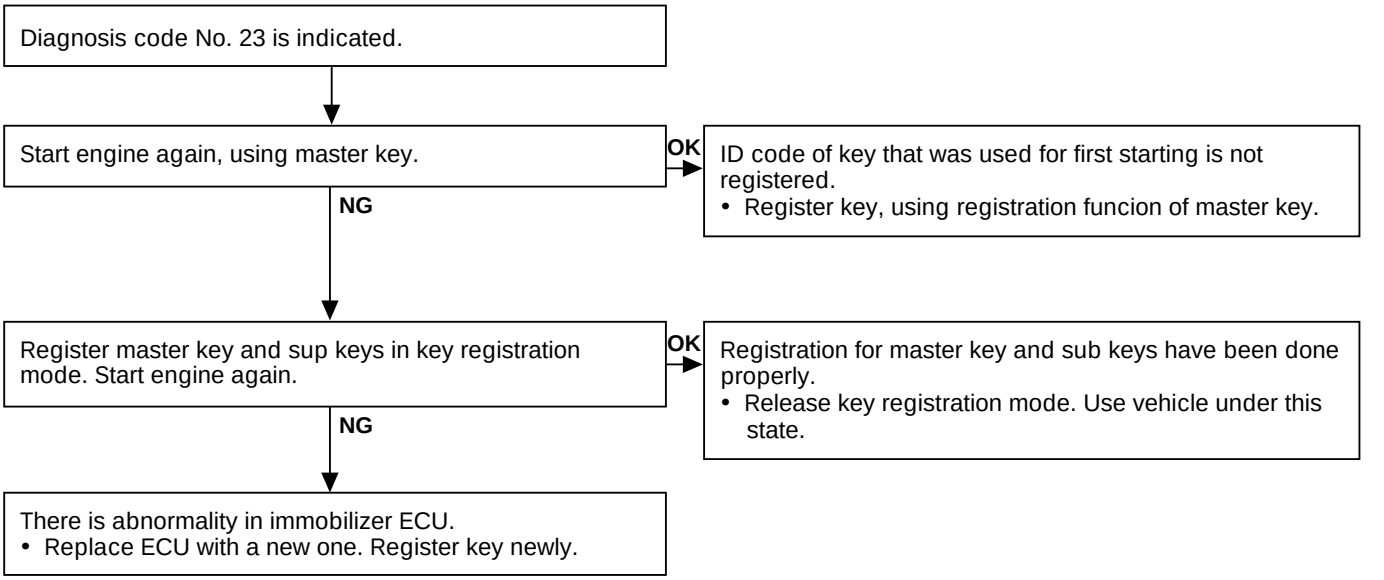
JBE00344-06022

3. Diagnosis code No. 21 is indicated



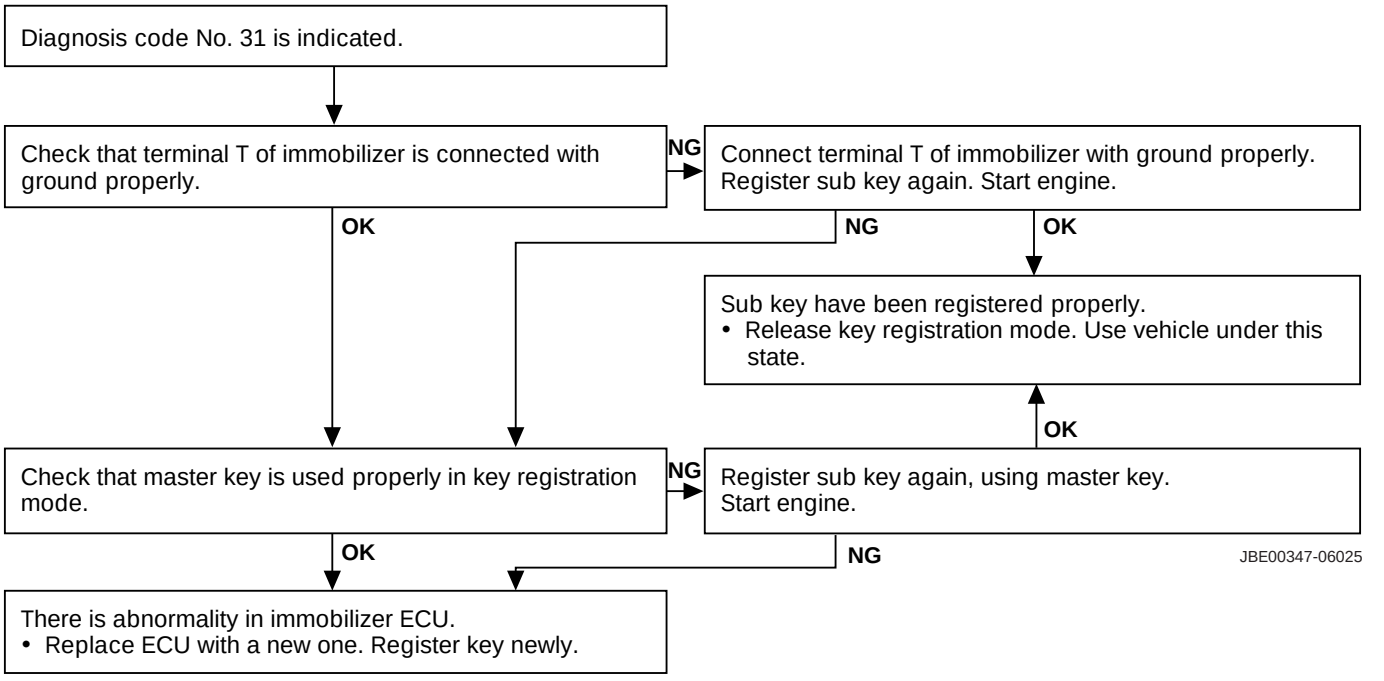
JBE00345-06023

4. Diagnosis code No. 23 is indicated.



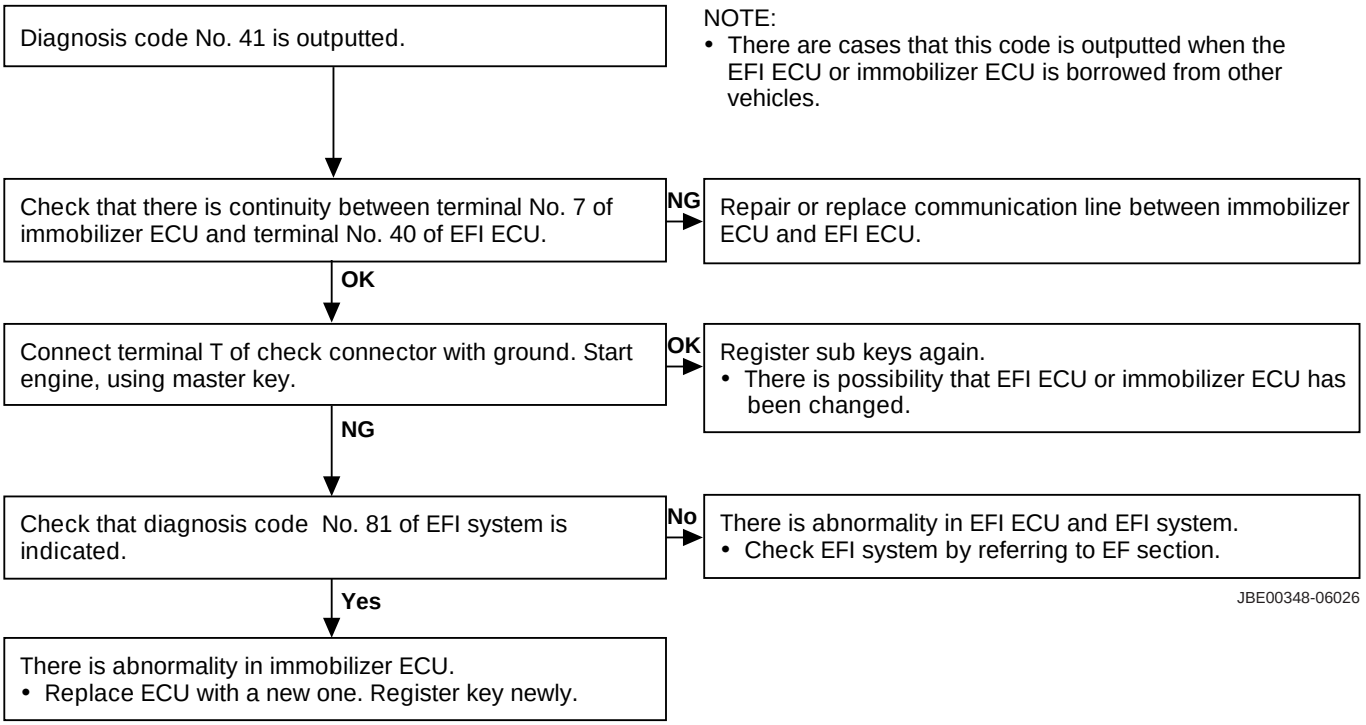
JBE00346-06024

5. Diagnosis code No. 31 is indicated.



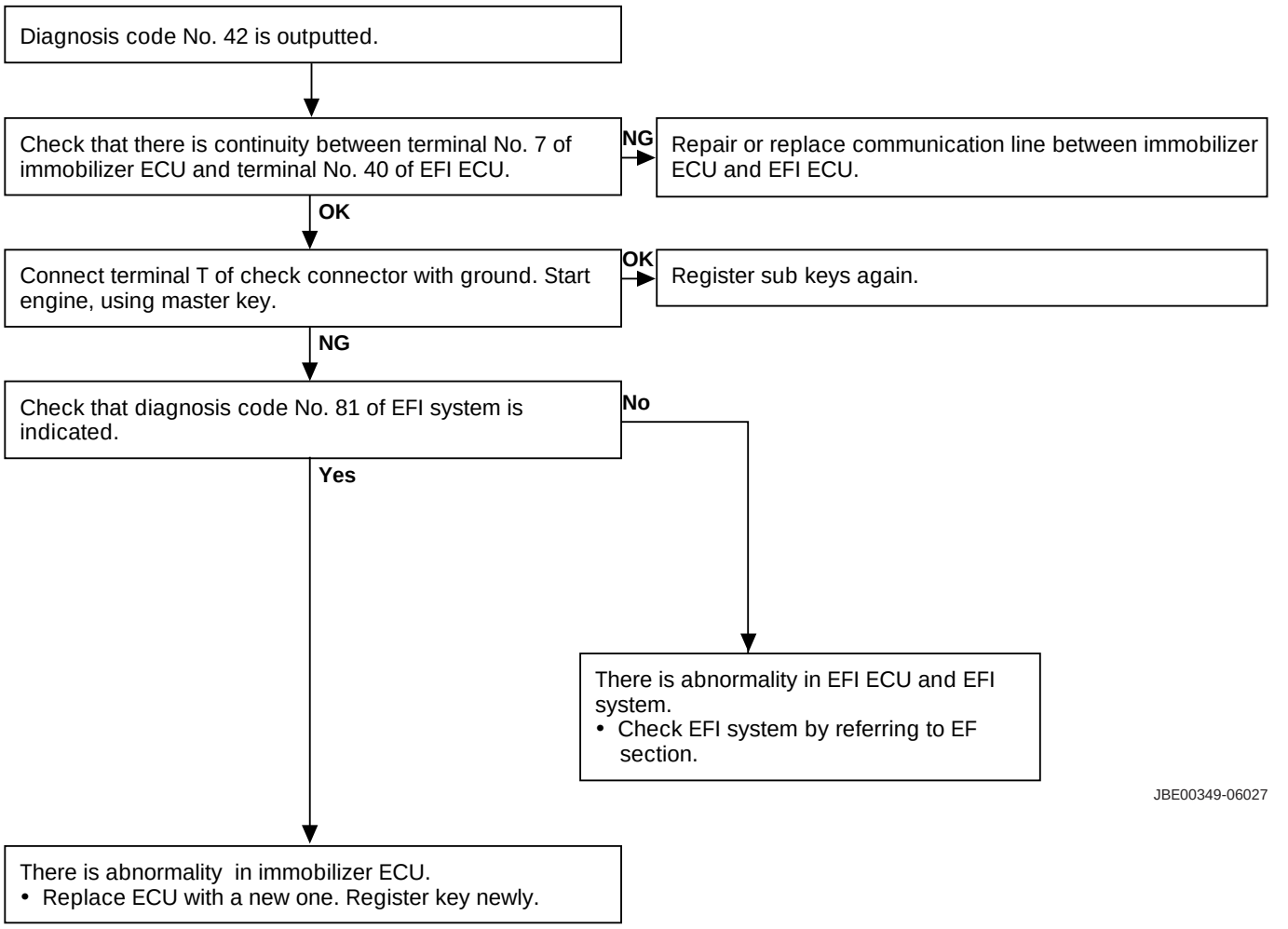
JBE00347-06025

6. Diagnosis code No. 41 is outputted.



JBE00348-06026

7. Diagnosis code No. 42 is outputted.



FUNCTION CHECK OF IMMOBILIZER SYSTEM

The function check of the immobilizer system can be performed by doing the following two checks.

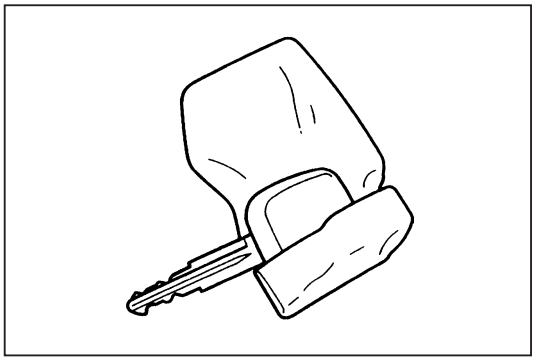
1. Ensure that the engine starts by using the master key and sub key.
2. Ensure that the engine will not start with a key without the transponder.

In the check 1., the system can be checked easily by using the master key and sub key.
Now we explain that the check can be made in the following method as one of the check method of 2.

JBE00350-06030

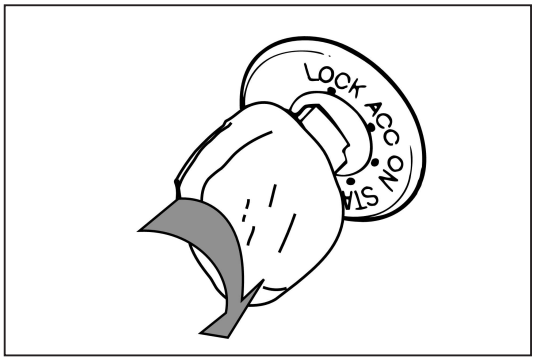
Checking procedure

1. Wind a piece of aluminum foil or the like at around the resin section of the key of the vehicle concerned.
   (The aluminum foil shuts off the magnetic field, thus preventing the transponder from being energized.)



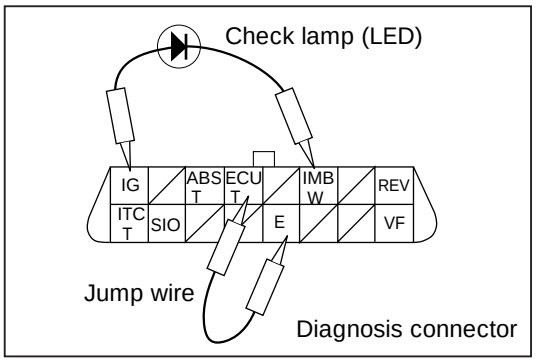
JBE00351-06031

2. Start the engine with the key wound up with the aluminum foil. Check that the engine will not start.



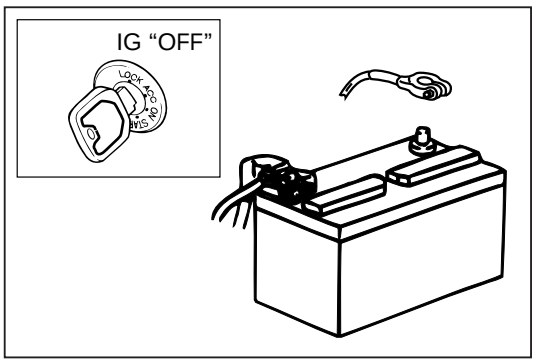
JBE00352-06032

3. Install the check lamp to the diagnosis connector.
   Connect the jump wire between Test terminal and earth terminal. Ensure that the diagnosis code No.12 is outputted.by the indicator lamp.



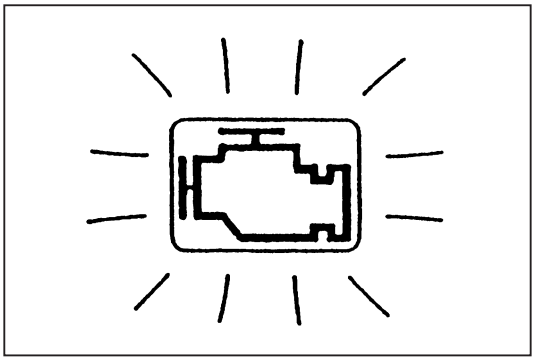
JBE00353-06033

4. After confirming the diagnosis code of immobilizer system and EFI system, erase the diagnosis code No. 81 memorized in the EFI ECU by removing the terminal (–) of the battery.



JBE00354-06034

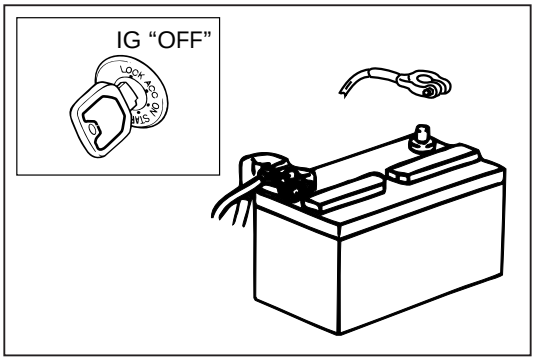
5. Ensure that the diagnosis code No.81 has been erased and that the normal code is being outputted. Remove the check lamp and jump wire from the diagnosis connector.



JBE00355-06035

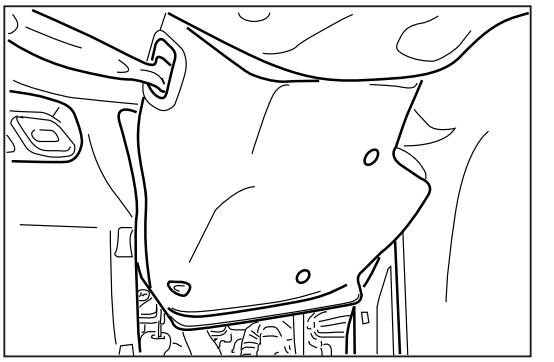
REPLACEMENT AND INSTALLATION OF ANTENNA COIL

1. Disconnect the battery ground cable from the negative (–) terminal of the battery.



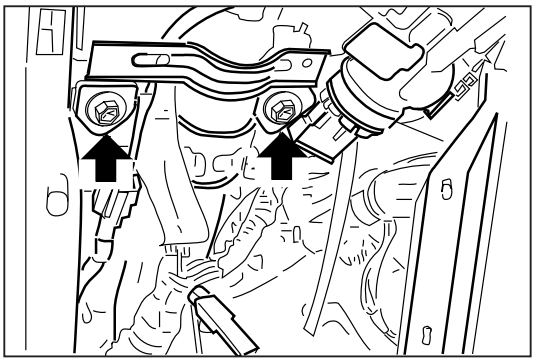
JBE00356-06036

2. Remove the instrument lower finish panel and steering column lower cover by loosening the attaching screws.
3. Loosen the steering column attaching bolts.
4. Remove the steering column upper cover.
5. Disconnect the connector of the antenna coil and remove the wire band.
6. Removal of antenna coil.
   (1) Loosen the antenna coil attaching screw.
   (2) Remove the antenna coil from the ignition key cylinder.
7 Attach a new antenna coil to the ignition key cylinder and tighten the attaching screw.
8. Attach a new wire band.



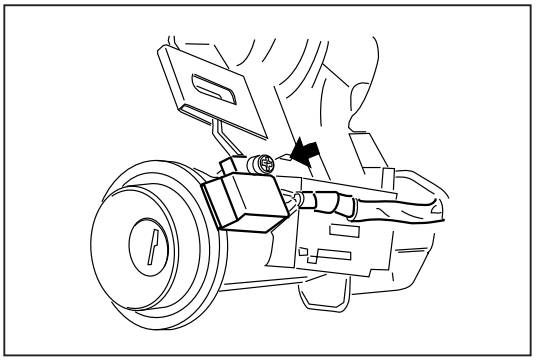
JBE00357-06037

9. Connect the connector of the antenna coil.
10. Install the steering column upper cover.
11. Tighten the steering column attaching bolts and nuts.
    Tightening Torque:
    Nut, lower side 9.8 - 15.7 N·m
    Bolt, upper side 14.7 - 21.6 N·m



JBE00358-06038

12. Install the steering column lower cover and instrument lower finish panel with attaching screws.
13. Connect the battery ground cable to the negative (–) terminal of the battery.



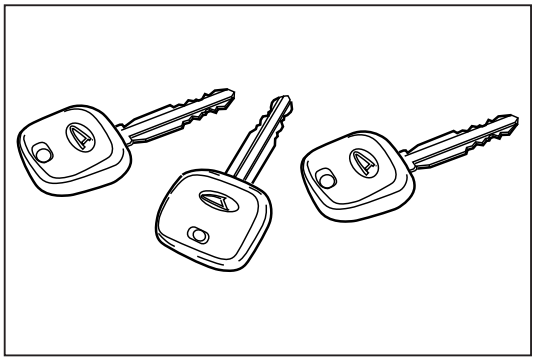
JBE00359-06039

REGISTRATION OF SUB KEYS

The vehicle is provided with one master key and two sub keys. However, up to three sub keys can be memorized in the immobilizer ECU by using the sub key registration function of the master key.

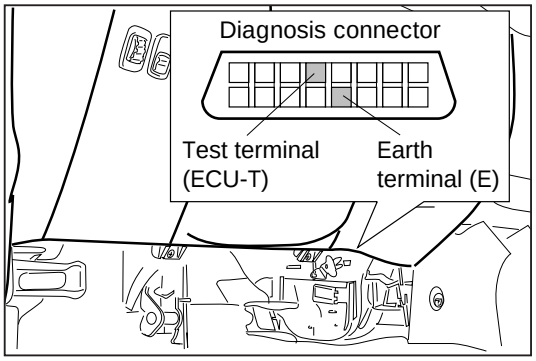
CAUTION:

- The master key (black) has the sub key registration function. Hence, be very careful not to lose or damage the master key.
- If the master key is lost or damaged, it is imperative to erase the memory of the immobilizer ECU and to re-register the master key and sub keys, using the diagnosis system (DS-21).



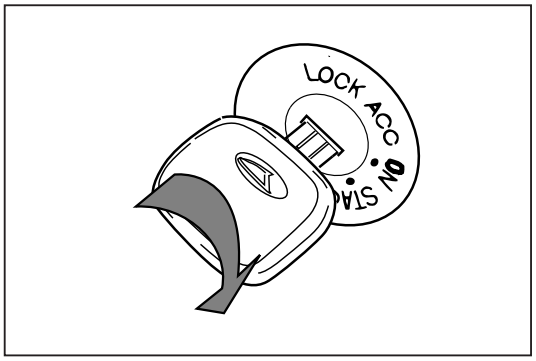
JBE00360-06040

(1) Connect the jump wire between test terminal and earth terminal.



JBE00361-06041

(2) Start the engine, using the master key.
When the engine starts, the key registration mode is assumed.
(3) Stop the engine. Within ten seconds after the engine stopped, start the engine with the sub key.
When the engine starts, this sub key is memorized in the immobilizer ECU.
(4) To register the next sub key, repeat the steps (1) through (3).



JBE00362-06042

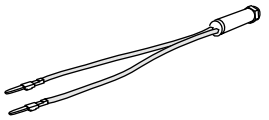
CAUTION:

- In the key registration mode, the memories of all sub keys are erased. It is, therefore, imperative to register the all sub keys when a new key is added.

(5) After all sub keys have been registered, remove the jump wire from the diagnosis connector.
(6) Ensure that the engine starts with all keys.

JBE00363-06043

SSTs (Special service tools)

Shape	Part No.	Part name	Use	Remarks
	09991-87211-000	Diagnosis check wire	To read the diagnosis codes for checking ECU input/output signals	BE–94

JBE00364-07001

TIGHTENING TORQUE

Tightening component	Tightening torque		Remarks
	N·m	kgf-m	
Water temp. sender gauge × Cylinder block	24.5 - 34.3	2.5 - 3.5	
Fuel sender gauge × Fuel tank	1.5 - 2.5	0.15 - 0.26	
Steering column × Support brackect (Lower side)	9.8 - 15.7	1.0 - 1.6	Nut
Steering column × Support brackect (Upper side)	14.7 - 21.6	1.5 - 2.2	Bolt
Steering wheel × Steering shaft	27.5 - 41.2	2.8 - 4.2	
Steering wheel × Steering wheel pad assembly	5.2 - 9.5	0.53 - 0.97	TORX® bolt
Passenger's side air bag × Instrument panel	6.7 - 9.5	0.68 - 0.97	Bolt

JBE00365-07002

TO INDEX TO NEXT SECTION